PIT and QUARRY

MARCH 1959

Convention Reports:

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- ▶ National Crushed Limestone Institute page 87

Weston & Brooker's New Crushed Granite Plant

page 80

SOMETHING NEW UNDER THE GROUND

Revolutionary I-R
"DOWNHOLE" DRILL

service-proved on millions of feet of hole,
now available in FOUR SIZES,
with constant, thru-the-bit hole cleaning!

The I-R DOWNHOLE drill is a rugged, heavy-duty, sub-surface percussion drill that delivers full striking power *right at the bit*. Hundreds of units, in operation all over the world, have drilled millions of feet of hole with outstanding records of performance and economy.

Designed for use with Ingersoll-Rand Drillmaster and Quarrymaster drilling rigs, the DOWNHOLE drill is also available to present users of other types of rotary drilling equipment. Conversion from roller cone bits to DOWNHOLE drilling is simply a matter of screwing the drill to the rod or adapter and adding an air-line lubricator.

Here are some of the features that put the DOWNHOLE drill in a class by itself.

PATENTED HOLE CLEANING. All operating air is exhausted through the bit and additional *high-pressure air* blows continuously through the bit for maximum hole cleaning, even while drill is not running.

RENEWABLE WEAR SLEEVE. The entire unit is encased in a renewable wear sleeve that can be replaced at low cost when the outside diameter is worn down. (Patent Pending)

THREADLESS CARSET BIT DESIGN. The service-proved result of years of experimentation and field operation, it has no threads to strip or work loose and no energy loss through a separate connection.

SEALED UNIT. There are no ports in the outside of the drill which could admit abrasive material into the working parts.

CHECK VALVE. An optional check valve can be mounted behind the drill to permit operation under great heads of water—keeps mud and cuttings out of the machine even when the drill is stopped.

SPECIFICATIONS	DHD-275	DHD-325A	DHD-400	DHD-500
BIT SIZES	4¾" & 5"	6" & 6½"	7" & 7½"	9"
ROD SIZES (O.D.)	4"	4" & 5"	5½"	7"
LENGTH (BIT EXTENDED)	52¼"	52½"	63¼"	68½"
OUTSIDE DIAMETER	4¼"	5⅛"	6"	7¼"
WEIGHT (INCLUDING BIT)	158 lb.	236 lb.	362 lb.	586½ lb.

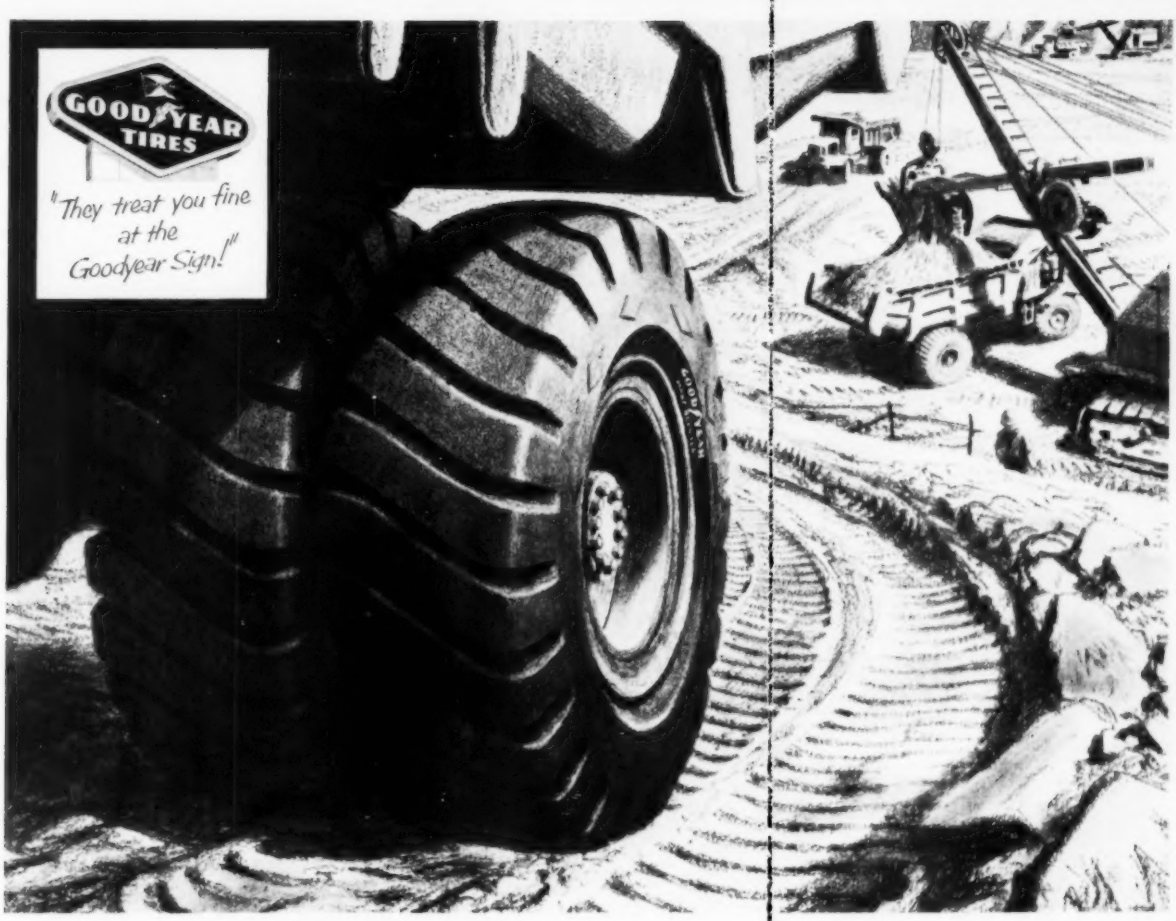
For further details, send for a copy of Bulletin 4203.

Ingersoll-Rand
11 Broadway, New York 4, N. Y.

5-864

A CONSTANT STANDARD OF QUALITY IN EVERYTHING YOU NEED FOR DRILLING ROCK

Enter Cover 2 on card, page 139

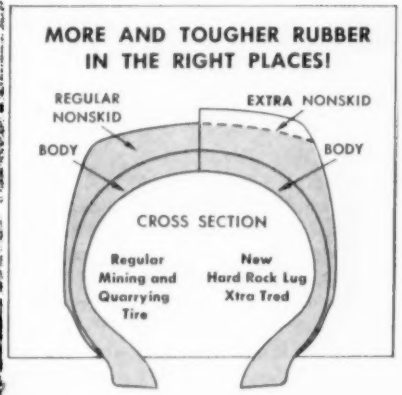


EXTRA TREAD TO TAKE IT WHERE THE GOING'S EXTRA TOUGH!

NEW HARD ROCK LUG XTRA TRED

Specially Engineered Tire for Mine and Quarry Work

More and tougher rubber in the right places—exclusive Triple-Tough 3-T Nylon Cord to back it up. That in a word is why this great new Goodyear tire tops its class. Specifically designed to take the hard knocks, the Hard Rock Lug Xtra Tred—with 18% more tread rubber, reinforced lugs, bonus shoulder heft and huskier sidewalls—stands up under tough punishment that kills lesser tires in short order. And thanks to 3-T Nylon Cord, greatest tire saver in 24 years, cuts, bruise-breaks and blowouts are reduced to an all-time low. Get full details from your Goodyear dealer now. Goodyear, Truck Tire Dept., Akron 16, Ohio.



GOODYEAR

Xtra Tred T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

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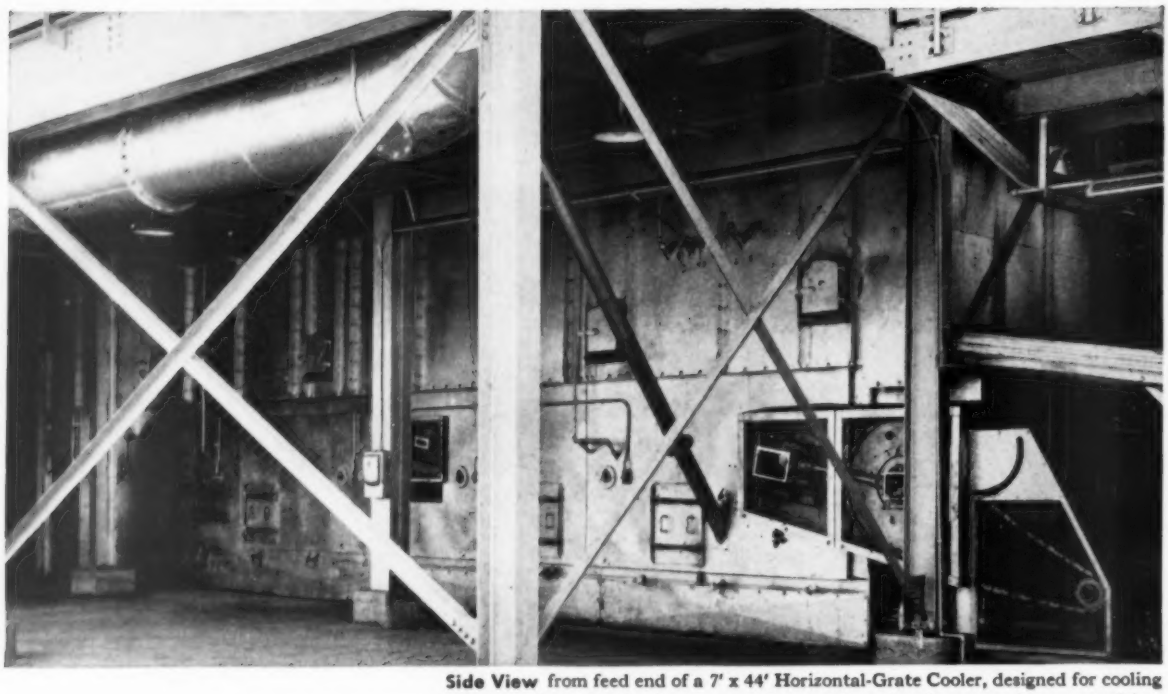
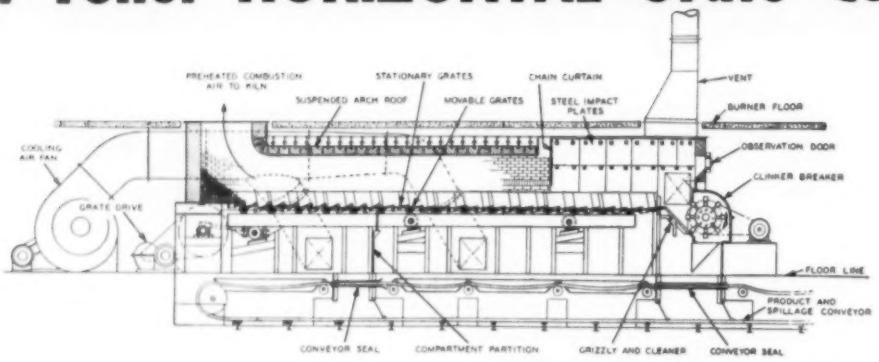
PIT AND QUARRY, March, 1959, Vol. 51, No. 9. Published monthly by Pit and Quarry Publications, Inc., 431 South Dearborn St., Chicago 5, Ill. Subscription price $3 for 1 year in the U.S., possessions and Canada. Central and South America $10 for 1 year, elsewhere $15. Single Copy $.50 except $1 for January, May and July. Entered as second class matter February 28, 1932, at the Post Office at Chicago, Ill., under the Act of March 3, 1879. Postmaster: Please send notices on Form 3578 and copies returned under label Form 3579 to 431 South Dearborn Street, Chicago 5, Ill.



Side View from feed end of a 7' x 44' Horizontal-Grate Cooler, designed for cooling 4,000 barrels of Portland cement clinker per day, showing crank type grate drive

New Fuller HORIZONTAL-Grate Cooler



Cross-section drawing showing construction and arrangement of a typical Horizontal-Grate Cooler with clinker breaker.

Compact . . . Economical . . . Fast-cooling. Already proven in use, the compact, efficient design of Fuller's new Horizontal-Grate Cooler promises savings for many plants. It's an ideal choice where headroom is at a minimum . . . where a short, compact unit is desired.

Like the famous Fuller Inclined-Grate Cooler, the new Horizontal-Grate type is meeting with wide acceptance. One of the new units, already in operation, is shown above.

A Fuller Horizontal-Grate Cooler or an Inclined-Grate unit is the right answer to your cooling needs. Fuller coolers are used for a wide range of materials including lime, dolomite, cement clinker, iron nodules, phosphate nodules, sinter, ores, and others. Fuller sales engineers will be glad to discuss your cooling problems and make recommendations for your plant—without obligation, of course.

Features of the Fuller HORIZONTAL-Grate Cooler

- Requires a minimum of headroom
- Short length if necessary
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- Less refractories
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- More rapid clinker distribution
- More uniform bed thickness

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"See Chemical Engineering Catalog for details and specifications".

PIT and QUARRY

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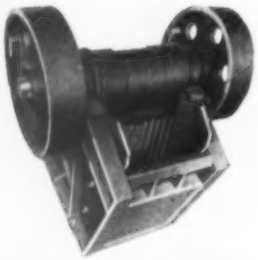
Since 1885 **GRUENDLER QUALITY**
THE BEST THAT MONEY CAN BUY

Your Crushing Problem Solved!

Here you see three types of
GRUENDLER CRUSHERS
in a wide range of sizes and capacities for the crushing of ROCK, ORE, GRAVEL and CEMENT

Over 11 million tons of crushed material are produced annually by Gruendler Crushers



Heavy Duty Roller Bearing
JAW CRUSHER

Heavy Duty Roller Bearing
DOUBLE ROLL CRUSHER

Heavy Duty Single Rotor
IMPACT CRUSHER

The Gruendler Two-in-one Impact Crusher
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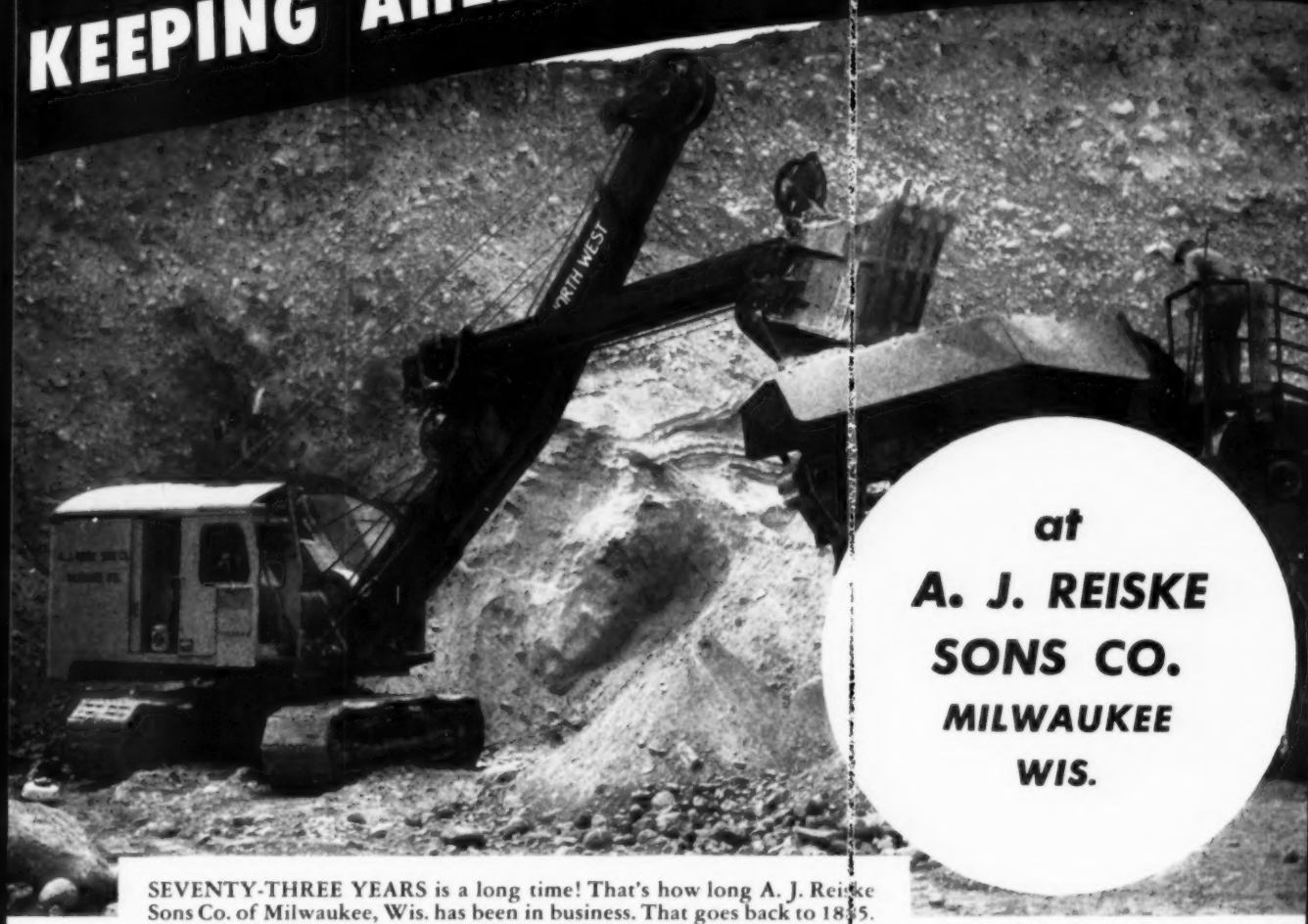
KEEPING AHEAD OF THE CRUSHER



at

A. J. REISKE SONS CO.

MILWAUKEE WIS.

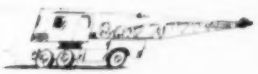
SEVENTY-THREE YEARS is a long time! That's how long A. J. Reiske Sons Co. of Milwaukee, Wis. has been in business. That goes back to 1865. A. J. Reiske Sons Co. is one of the original producers of gravel as a business in the State of Wisconsin. They produce Processed Bank Run Gravel to meet Wisconsin State Highway Department specifications.

Here is another case where dependability counts. *Your Northwest is always ready to go. We hear it everywhere and Northwest users will tell you so.*

On jobs like this a shovel has to keep a-runnin' and Northwest dependability has been recognized by the Reiske organization and other pit operators throughout Wisconsin.

Your Northwest is built for the toughest job a shovel has to do—it's a *real* rock shovel—gives you higher output in rock and makes easy digging easier.

Look at that dipper—a heap every time. Smooth control; accurate spotting; jerk-free, grab-free swing and the Northwest Dual Independent Crowd combine to pour out the material. There are no slowdowns or delays in a Northwest's digging cycle and it means more loads at the day's end. There is a lot more to the story. Ask for complete details and let us send you a catalog, on the size machine you need.



Perhaps Rubber Tired Equipment will do your job better. The Northwest Truck Crane brings you a combination of advantages found in no other similar machine. 25 and 35-ton capacity.

NORTHWEST ENGINEERING CO.
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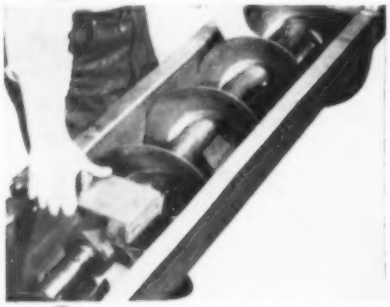
First time you've ever seen a conveyor screw changed so fast!

First, take out coupling bolts and filler piece from right-hand end of section to be removed.

Second step: take out coupling bolts and filler piece from the preceding section.

Rotate screw being removed 180 degrees so slot on preceding section is up. Then unbolt hanger.



Now simply lift the conveyor section from the trough and assemble the new one in its place.

RUNNING AGAIN. After less than 30 minutes, the conveyor is back at work.

LINK-BELT Quik-Link conveyor screw eliminates need to pull down entire conveyor line

Down-time is held to the barest minimum with the Quik-Link conveyor screw. It speeds and simplifies the maintenance man's job . . . other components need not be dismantled. And Quik-Link is just one of a whole group of new Link-Belt screw conveyor components that are cutting maintenance and power demands to a new low.

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- *TROUGH END SEAL*—keeps grease in, dirt out. Used with lip, felt or waste packing seal to prevent bearing-product contact.
- *DOUBLE BALL BEARING FLANGE BLOCK*—resists overhung loads at drive end and takes thrust loads of screw.

For complete facts, call your nearest Link-Belt office or authorized stock-carrying distributor. Or write for Folder 2489.

LINK-BELT

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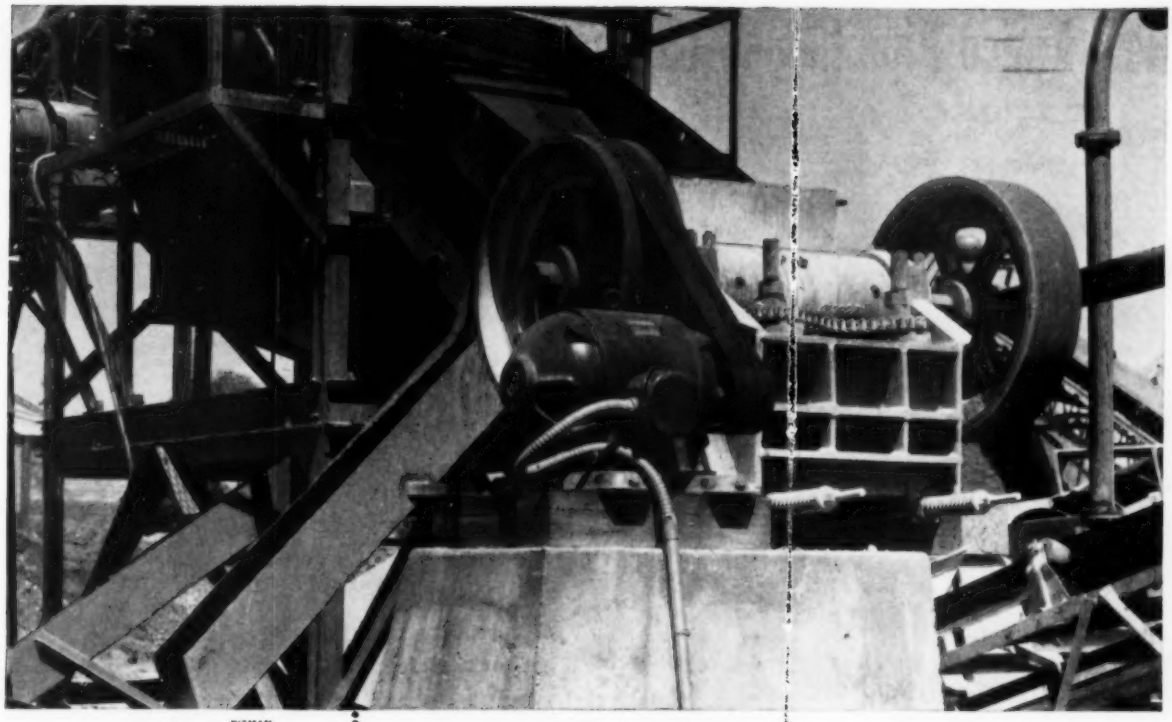

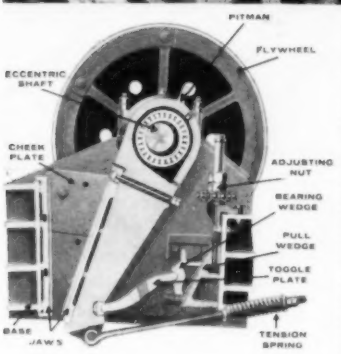

A Key unit for full time peak performance

DIAMOND JAW CRUSHER

Whatever the set-up and no matter how rugged the job, Diamond's "long-jaw" handles hardest rock with ease . . . day in, day out. A positive and uniform crushing cycle combined with quick jaw openings permits fast feed and discharge, insures full time peak performance . . . superior crushing records.

Diamond's Jaw Crushers are built to take it! The Pitman operates on a heat treated, forged alloy steel shaft and supports the moving jaws. Extra long and made of manganese steel, the jaws are easily changeable and reversible for longer service. A *double row* of adjustable Timken bearings for both main and Pitman bearing assemblies carries the heaviest radial and thrust loads—a Diamond exclusive.

Records in hundreds of pits, quarries, construction jobs, prove that Diamond Jaw Crusher is a top performer. Its ability to take rough punishment and to produce greater tonnage per square foot of jaw area make it a profitable investment. If it's your responsibility to produce continuous tonnages and see that aggregate production costs are kept down, you'll want complete details on Diamond Jaw Crushers. Write for Catalog D-116 . . . no obligation.

Diamond Jaw Crushers in 11 Sizes

Capacities 1½ to 500 tons per hour

6x12	10x36	24x36
10x16	15x24	30x42
10x20	15x36	36x48
10x24	20x36	

Diamond makes everything for the aggregate producer:

Jaw Crushers • Roll Crushers • Conveyors • Screens and Washers • Feeders and Bins • Portable and Stationary Crushing Plants for Rock and Gravel.

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How Armco Pipe helped La Guardia Airport "Grow" 15 acres

New York City's La Guardia Airport is getting a new 15-acre parking lot where a boat basin used to be. A two-mile line of Armco Special Analysis Steel Pipe brought sand fill from an offshore dredge to fill in the 10-foot-deep basin. Pontoon floats and timber supports carried about one mile of the line from the dredge to the shore, with another mile running overland to the fill area. The project is part of a $35 million, 6-year improvement program.

For all hydraulic materials handling jobs, you will find that Armco Special Analysis Pipe offers many advantages. The extra abrasion resistance of Armco Pipe means lower costs per yard of material carried. Write us for more details. Armco Drainage & Metal Products, Inc., 5399 Curtis Street, Middletown, Ohio.

Offshore portion of the 20-inch diameter Armco Pipe delivering sand fill to expand La Guardia Airport.

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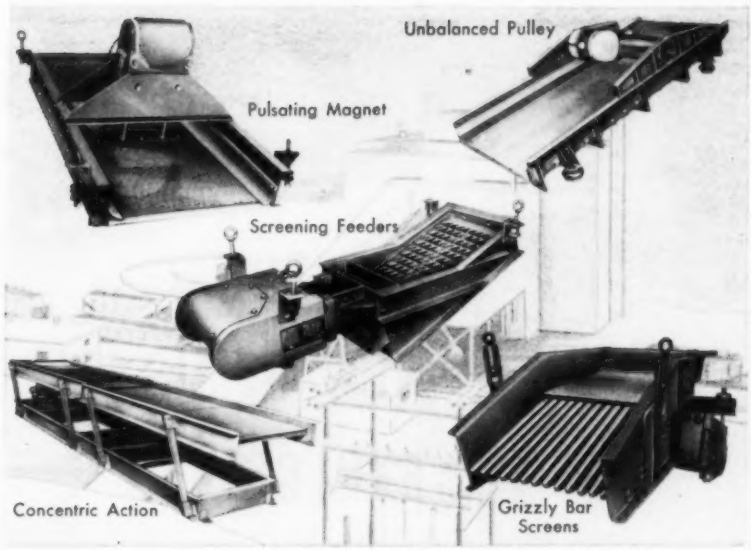
SYNTRON

VIBRATING SCREENS



for efficient, dependable, low cost scalping, sizing, dewatering or fine screening

SYNTRON builds a vibrating screen for every screening job from heavy duty scalping of rock for crusher to fine quality control screening of aggregates.

SYNTRON Vibrating Screens are built in a variety of styles—one, two or three deck models with drive units designed for each particular screen. Available in sizes ranging from 2 feet wide x 5 feet long to 6 feet wide x 14 feet long plus the 4 feet wide x 20 feet long conveyor screen.

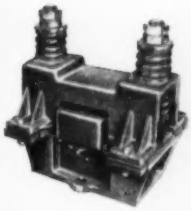
SYNTRON Screens provide uniform vibration, eliminating dead spots. Constant full screen efficiency provides more effective separation and higher capacity.

SYNTRON Screens combine efficiency, dependability and low maintenance to give better separation, greater tonnage at lower cost.

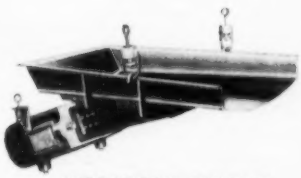
SYNTRON Screens are compact, easy to install, easy to maintain.

Write for complete information on all SYNTRON Screens

Other SYNTRON Equipment of proven dependable Quality



BIN VIBRATORS



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PACKERS & JOLTERS

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$220?
$270?
$310?
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*For packing industrial explosives

One of these figures probably comes close to the potential savings in YOUR operation when you switch from your present method to the new and improved Bemis Explosives Bags. It depends, of course, on how many holes you shoot per day, and how heavily you load the holes.

Take, for example, the figure of $270 per day savings. It works out this way: Cans cost approximately 70 cents each. Assuming you load 10 cans per hole and shoot 60 holes per day, your container cost is $420 per day.

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Furthermore, Bemis Explosives Bags are the toughest *really waterproof* explosives bags you can find. Leave them in wet holes three days or more . . . and they still shoot perfectly. The Bemis extruded seamless poly liner provides the waterproofness; the tough burlap or Bemis Flexiply® (multi-ply creped kraft) outer tube supplies the strength.

Look for the *red stripe* which identifies Bemis-extruded *pinhole-free* poly. Write or phone us . . . and a Bemis specialist will see you promptly.

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There's a simple solution to that problem . . . a Bemis Packer-Ette. The capital investment is surprisingly small. It maintains a steady production of six bags per minute. Two-man operation . . . substantial labor saving. Accuracy to 3 ounces on a 33-lb. bag. *Complete* cleanliness.

You can't beat that. Let us tell you about the Packer-Ette, too.

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Washington News Letter

By S. HERBERT UNTERBERGER

IN RECENT years, it appears that the Congress has taken its authority to investigate almost as seriously as its principal authority of legislating. The current Congress appears to be no exception.

From present indications, there may be at least two major Congressional economic investigations. There will be the usual investigation by the Joint Economic Committee, which is charged by legislation with the responsibility of reviewing the President's Economic Report and also of reporting to the Congress under the Full Employment Act.

For the first time in its history, this committee is headed by a professional economist, Senator Paul Douglas (D., Ill.) who, for many years, was a leading professor of economics on the faculty of the University of Chicago. Despite some fairly obvious attempts to prevent him from ascending to the chairmanship of this committee, Senator Douglas had the authority to take the post. The abortive effort to prevent this took the form of trying to convince Senator Sparkman (D., Ala.), whose seniority exceeded that of Senator Douglas, to relinquish his position as chairman of the business committee in order to move to this chairmanship. Apparently, Senator Sparkman would have none of it.

Now that Senator Douglas, who is one of the prominent members of the most liberal wing of the Democratic party, has this position of leadership, it is expected that he will use it to make probing investigations in a wide variety of economic areas. These investigations will probably be designed principally to embarrass the Republican Administration by highlighting the relationship between that administration's economic measures and the benefits derived from them by large banks, insurance companies, large businesses, etc.

It is generally believed in Washington that Senator Lyndon Johnson (D., Tex.) played the principal role in trying to prevent Senator Douglas from achieving his aim of heading this important committee. Since he was not successful in that attempt, he is expected to put his rather considerable influence behind the development of additional, if only temporary, committees charged with the responsibility of making broad economic studies. Generally, they will concern themselves with problems of inflation and of economic growth. It should be pointed out that his objective is not only that of competing for prominence with The Joint Economic Committee, but also of offsetting the effect of certain Administrative activities.

Since the Administration does not control the Congressional investigation machinery and therefore cannot use it to reach its own objective, the Administration is developing a separate investigation apparatus.

The first step along this line was the recent development of a Cabinet Committee on price stability for economic growth. This committee, headed by Vice President Nixon, will include Treasury Secretary Anderson, Postmaster General Summerfield, Agriculture Secretary Benson, Labor Secretary Mitchell, and the chairman of the Council of Economic Advisors, Raymond J. Saulnier. It will be well supplied with funds to employ top-flight economists. Since Vice President Nixon has very obvious presidential aspirations, the work of this committee can be expected to receive much prominence.

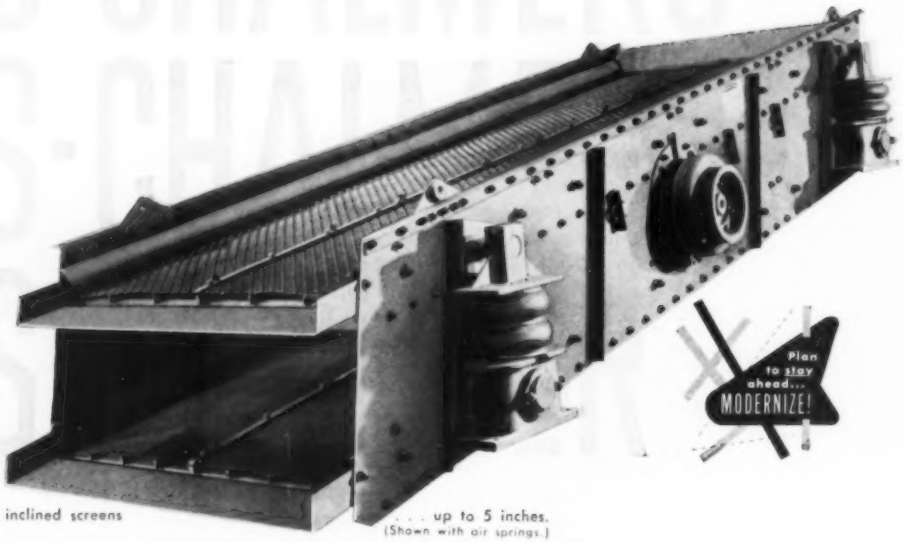
The above investigation group is expected to direct its attention to rather immediate objectives, not the least of which are the Vice President's political interest. At the same time, however, the President's State-of-the-Union Message indicated that a commission is to be created on national goals.

From every indication, this group will be headed by Treasury Secretary Anderson, or he will probably play a very prominent role in its development. This commission would concern itself with more long-range objectives, such as how to attain lasting prosperity, how to meet the needs of a rising population, how to achieve both full employment and a stable price level. A commission of this kind would probably have a less political character than the Cabinet Committee and would, if present plans materialize, be composed of persons prominent in various phases of American life, such as business, labor, and education.

All of these investigating committees are obviously designed to achieve maximum prominence. The Administration is also developing a parallel economic investigating group, under the direction of Chairman Saulnier, which is to be composed of working government economists. They will attempt to evaluate government policies in relation to their inflationary impact. It is expected that their investigation will range from the activities of the Armed Services, who exercise a very large economic force through their buying power, to the activities of such regulating agencies as the Interstate Commerce Commission or the Federal Trade Commission.

This group will be composed of hard-working economists whose findings will probably be used by the Nixon Cabinet Committee, of which Mr. Saulnier is also a member. The net effect will be that business and business activities can

(Continued on page 72)



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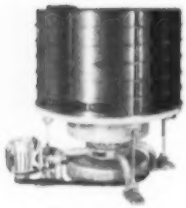

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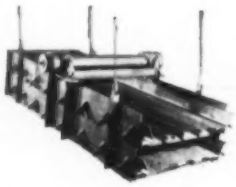

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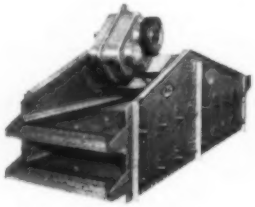

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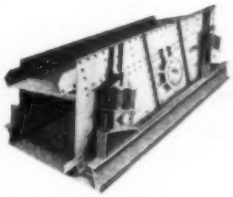

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Labor Developments

Labor Reform Legislation

By S. HERBERT UNTERBERGER

S. Herbert Unterberger and Company
Economists-Consultants on Labor and Industrial Relations
Washington, D. C.-Philadelphia, Pa.

ONE of the first items of business before the current session of Congress, was the consideration of two labor reform bills. This was so principally because the foundation was so well laid by the revelations resulting from the investigations of the McClellan Committee in the preceding session. The first of these measures, the Democratic bill, was submitted by Senator Kennedy of Massachusetts, the other, the Republican bill, by Senator Goldwater of Arizona, shortly after President Eisenhower delivered his labor message.

It is especially interesting that at the heart, these pieces of legislation are virtually identical. This core is the labor reform part. The differences, over which a bitter fight seems to be developing, do not deal with reform, but rather with amendments to the controversial Taft-Hartley Act.

The Democrats are trying to add a few less popular amendments to that basic labor law which are preferred by their trade union constituency. The Republicans are trying to add various amendments to the Taft-Hartley Act which are preferred by their business constituency. Both sides appear to be assuming that the reform measures can be passed with ease and that, therefore, they should not miss the opportunity to append to them some other provisions which they would like to see passed, but which, if proposed on their own, would have rough going.

It appears, therefore, that restrictions on union activities which have been agreed upon will almost certainly be enacted into law very soon. They are desired not only by businessmen and government officials, but also by the more responsible and respectable parts of the labor movement.

Those restrictions will require unions to file detailed financial reports—probably with the U. S. Department of Labor—which will be open for inspection to the public. The Secretary of Labor would also be authorized to inspect the books and records of trade unions to check on the validity of the reports and to determine whether any fraud had been engaged in. This is an attempt to attack one of the basic abuses revealed by the McClellan investigation, namely, the use of union funds for the private purposes of union officials.

Proceeding further along these lines, legislation will probably be passed to require that union officials disclose a great deal about their personal financial transactions in any situation involving a conflict of interests between the private benefits and their union responsibilities. As a further preventive against an obvious temptation, the proposed legislation would bar both employers and unions from lending money to union officials.

Although these matters are generally covered by state criminal statutes, the legislation proposed by both parties would make it a *federal* crime for union officials to embezzle union funds or falsify union books. In addition, these bills would permit union members to go into federal courts to sue their officers for the return of any moneys embezzled or misappropriated. All of these points represent a legislative attempt to keep union leaders honest.

At the same time, these proposals would include methods for getting rid of dishonest union leaders. It would permit the elimination from union office of persons who have been convicted of major crimes. It would also authorize the Secretary of Labor to go into the court for the purpose of setting aside improper union elections and also to require new elections.

The legislation which is most likely to be passed will strike directly at one of the most frequently used techniques for the continued maintenance of union control in a few generally corrupt hands. It is the technique whereby international union officers eliminate opposition through establishing trusteeships over local unions which are led by forces which they regard as disloyal. In the past, such trusteeships have frequently lasted for many years. Certain proposed legislation would set a time limit on trusteeships imposed by top union officials. It would enable the members of local unions so dominated to throw off the central domination through court action.

These are the principal reforms about which there is no longer any serious controversy. If they, and they alone, are included in a labor bill, that legislation would probably pass quickly and almost unanimously. It is the "caboose on the train" which is causing all the trouble.

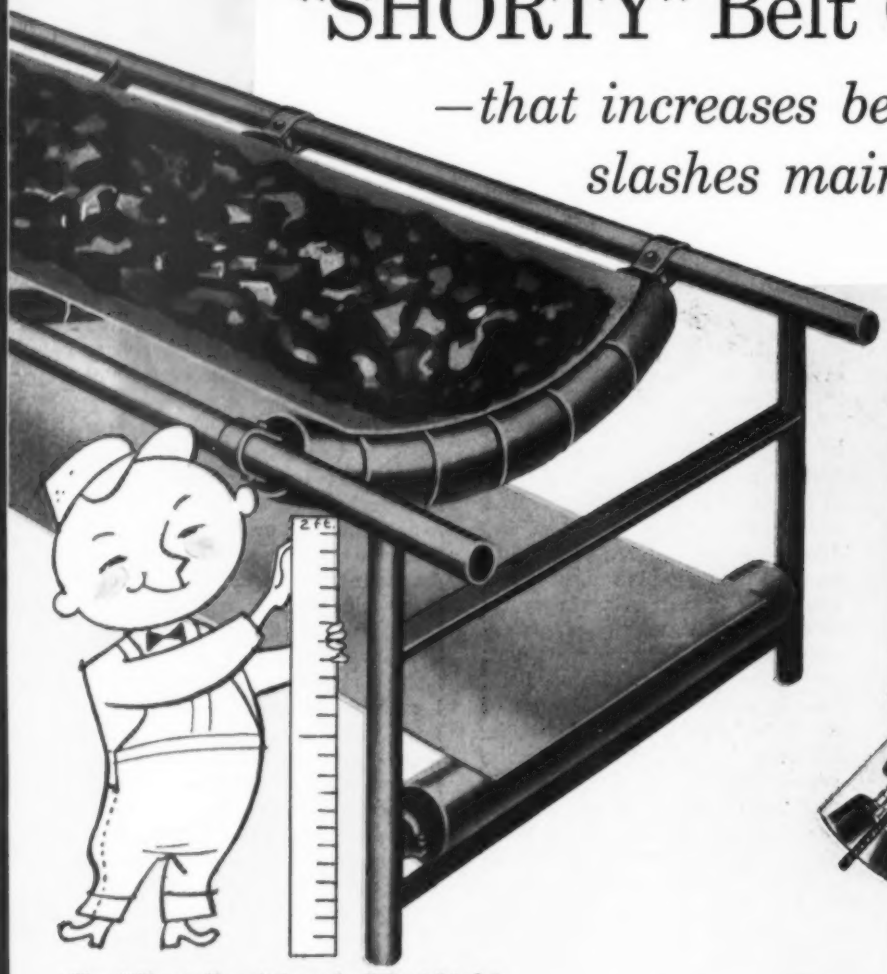
Senator Kennedy (D., Mass.) would like to add an amendment to the Taft-Hartley Act which would provide that "economic" strikers would not be deprived of their right to vote in representation elections although they have been replaced in the course of a lawful strike. This is an amendment long sought by the labor movement. As the situation now stands, a labor union may lose an election held after a long strike because the strikers are generally no longer employed and therefore cannot vote.

(Continued on page 72)

See the NEW McNally Pittsburg

"SHORTY" Belt Conveyor

—that increases belt life, slashes maintenance cost!



The "Shorty" unit is only 2 feet high!

The new "Shorty" underground conveyor featuring the new McNally Pittsburg Cradle Idler is ideally suited for use in limited working areas. Vertical supports are only 2 feet high. For extremely low clearance installations these conveyors can be made with 3″ diameter rollers (instead of the standard 5″), and the average over-all height can be as little as 17″ for a 36″ belt, using a 30° deep trough idler construction.

For "Do-it-yourself" construction, the H-frames and stringers (which may be either wire rope or pipe stringers) are shipped disassembled and may be assembled in the field to fit any conveyor length necessary. It is only necessary to cut the stringers to the desired length, attach the Cradle Idlers and H-frames, and your conveyors are ready for operation.

Exclusive NEW Patented Cradle Idler*

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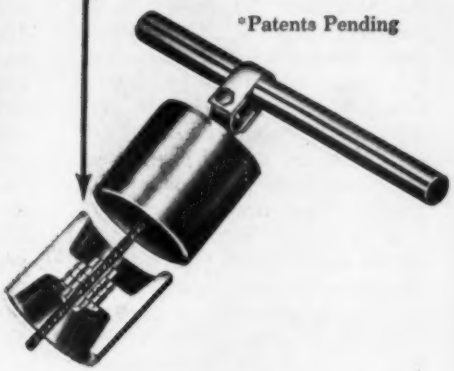

The secret of the dramatically improved performance and lower maintenance cost of this new heavy duty conveyor is the *true catenary suspension* of the Cradle Idlers. Since the rollers *rotate* on the steel rope, dangerous "loping and harmonics" cannot develop. The 5" rubber rollers, assembled on precision ground ball bearings, are prelubricated, lifetime sealed.

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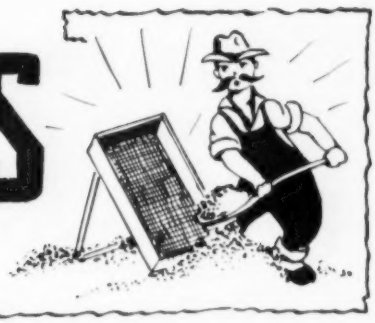

By RAY L. SMITH JR.

IN THE CITY of Washington are more than a hundred thousand documents in Russian. Included: the coverage of a wide spectrum of current scientific and technical interest.

Here we have the reports of Russian learned societies and the published works of Russian scholars. Subjects range from anthropology and biology and chemistry through metallurgy and physics to X-rays and zymology. Hundreds of items are received monthly.

But we can't use them. They haven't been translated. There are no funds to do it. Evidently it was felt, "There wouldn't be much to interest us . . . "

Red High Heels

HIGH HEELS have come to Moscow. You can see one whole window display of them, two to three inches high at Gum, Department store on Red Square.

So the Soviet women go to Gum, take in the window display and work their way through the crowds into the jam-packed store.

The Women's Shoe Department is on the ground floor. It shows some improvement over previous years. Now there are some benches where the gals can sit down and try their shoes on before they buy them.

There are a dozen varieties of low-heel shoes, unattractive but solid. There are no high heels in sight.

The ladies' "Shoe Salon of Stylish Footwear" on the floor above, just as crowded, has a few more varieties but nothing as frivolous as high heels.

"What high heels?" the salesgirl asks when the Moscow socialites finally get to her.

"The ones in the window display downstairs," the Comrades insist.

"Ah," she says with a mysterious smile, "That's upstairs in the 'atelier'—the shoes-to-order department."

So milady goes up another flight of stairs.

A sign on the door says the shoes-to-order department is closed and that it is open only on certain hours of certain days. It doesn't say what those hours or days are.

By this time the lovelies are ready to explode.

"How absurd," says one tired doll. "They aren't ours, anyhow. Must be another capitalist import."

This doesn't necessarily mean that Soviet women shun high heels. A few actually wear them. But, by and large, the average gal behind the Iron Curtain probably couldn't walk on those things anyway. Smart clothes are just another mark of capitalist decadence.

Potpourri and Succotash

This story, which has been making the rounds for some time, concerns a young lady teacher who took over classes for a friend who was on her honeymoon.

After the honeymoon, the newlyweds and the teacher friend happened to attend the same party. The hostess started to introduce the groom to the wife's friend.

"Oh," he said. "I know Miss Smith very well. In fact, she substituted for my wife on her honeymoon."

A suburbanite, his wife and four children were about to leave for their usual Sunday afternoon outing.

The woman started for the door. "This time, dear," she said, "you put the children's coats and hats on. I'll sit out in the car and blow the horn."

"There are four requisites to a good short story," explained the English teacher to her class. "Brevity, a reference to religion, some association with royalty, and an illustration of modesty.

"Now with these four things in mind, I'll give you 30 minutes to write a story."

Ten minutes later, Sandy's hand went up.

"That's fine, Sandy," said the teacher. "Now read your story to us."

Sandy read: " 'My God,' said the countess, 'take your hand off my knee.' "

Two men were adrift in an open boat. They'd been lost for five days without food or water and it was beginning to look like the end. Finally, one of them began to pray.

"Oh Lord," he said in a dramatic voice, "I've broken most of Your Commandments. I've been a hard drinker. I've run around with a lot of women. But if my life is spared I promise YOU—"

"Wait a minute," his friend interrupted. "Don't go too far. I think I see a ship."

There was a young woman who had so many children that she didn't know what to do, and another coming; so she went to the doctor and said, "Doctor, I keep having children; I don't know what on earth to do." He studied her a moment and then said, "You must take three aspirins." And she said, "When, before or after?" And he said, "Instead."

"Everybody all set back there?" called the bus driver.

"Wait a minute," a girl's voice said, "until I get my clothes off."

Every head in the bus swung around—to see a girl step off the bus carrying two packages of laundry.

Mr. J. (in bed upstairs)—It's two o'clock already. I'm going downstairs and ask that young man to leave.

Mrs. J.—Now dear, remember how we were when we were young.

Mr. J.—Migosh, I'll shoot him.

← Enter 14 on card, page 139

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More responsive dipper action, as much as 30% more bail pull, faster swing and *maximum* availability all add up to lower cost per ton—more net profit for users of P&H Electric Mining Excavators.

As much as 10% more production with P&H Electrics in leading mines and quarries throughout the world is the end product of patented *exclusive* P&H design principles.

MAGNETORQUE® . . . the most advanced hoist drive known for electric excavators. This hoist drive electro-magnetically transmits digging power from an A.C. hoist motor direct to the dipper. It provides higher bail pull and faster dipper fill with an *exclusive* degree of protection for the hoisting machinery from digging stresses.

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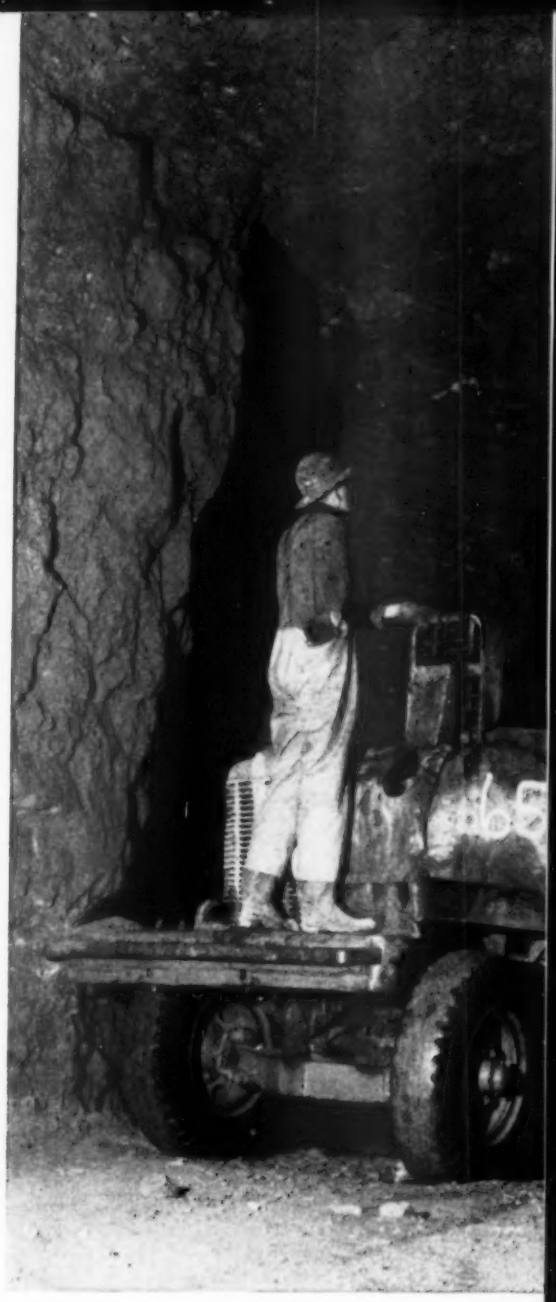
P&H MINING EXCAVATOR LINE: 3½ through 10 cu. yd. capacities

Enter 16 on card, page 139

Illustrated is one of two 5 cubic yard P&H Model 1500 Mining Excavators owned by a leading Eastern quarry. It is shown loading trap rock for crushing plant at their quarry located in the state of New York.



Average load of 8 tons takes a Michigan 2 to 4 minutes. Rock here averages 3% zinc (crushed and concentrated for shipment to smelting plants), 3% iron, 94% limestone (crushed and sold to railroads and contractors).

Tires replace tracks for underground zinc-ore loading at Eagle-Picher mine

Production boosted 40%, repairs cut in half

In the sprawling, honeycombed caverns of a zinc mine 300 feet below ground, two rubber-tired Michigan Tractor Shovels are loading out 40% more ore than the crawler loaders they replaced—proving mobility is an asset anywhere—even below the earth's surface.

Before the rubber-tired Model 175A Michigans were put to work in this mine near Galena, Illinois (one on the day shift; the other, at night), owner Eagle-Picher Company was using crawler loaders. Two things caused the switch to rubber. One, repairs on each crawler cost more than half *each year* of the total price of the crawler new. Two, lack of loader mobility was wasting time for all dependent equipment.

Since everything that goes in or out of the mine must travel through either of two mine shafts, it costs Eagle-Picher $500 or so just to lower, reassemble, and try out a new machine. But in this case, the company made up their "investment" in just a couple of shifts.

Save 60 minutes travel time

According to mine superintendent, Ed Houy—an 11-year veteran with Eagle-Picher—"First of all, an hour of waste time was eliminated every day. It used to take the crawlers 20 minutes to creep a mile or so from our central service area to the work site. And 20 minutes at the end of the day to come back again. The Michigans make the trip, either way, in five minutes. So 15 minutes a trip, 30 minutes total, are saved on each of our two shifts.

Triple output on scattered loading

"Mobility also pays off in certain areas of the mine where our 8-ton trucks can't be spotted right next to the shot rock," Mr. Houy continues. "Here, loaders must carry material as much as 100 ft. The rubber-shod machines often do three times the work of crawlers in these applications. The same advantage holds true when loads must be taken in succession from different headings in order to get the desired 3% blend of zinc for processing."

One Michigan keeps 5 trucks busy

Michigan output is high on straight loading too, according to general superintendent Harold Haman. "With trucks on average one-way haul distance to the crusher of about one mile," he says, "one Michigan loads out as much as 100 tons per hour. It alone keeps five 8-ton trucks busy. Each 8 ton load takes a Michigan three passes, two to four minutes (depending upon the digging and terrain). A typical day yields 1,400 tons of rock. Previously, with crawler loading, our top output was 1,000 tons. The daily increase, 40%."

Maintenance costs 50% lower

According to Robert Haffner, manager of Eagle-Picher's Illinois-Wisconsin operations, "Michigans not only load out more rock than the crawlers, but they also have proved cheaper to operate and maintain. Cost of maintenance per ton loaded *is about half*. Majority of the few repair jobs we've had have taken less than four hours to complete. And the shot rock, so rough that steel tracks and track frames required numerous overhauls, have been comparatively easy on tires. Recapping is needed only every 1,000 hours or so.

Enter 18 on card, page 13

Ownership of 4 Michigans proves satisfaction

"Before Eagle-Picher settled on Michigans, we tried other machines," continues Mr. Haffner. "After careful consideration, we decided Michigans had the sturdiness, mobility, and productive capacity we needed. We now do all loading here in Galena—and at our Wis. mine—with Michigans. Four of them. So you can see how much we like them!"

Michigan is a registered trademark of

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Rubber arteries serve the heart of this aggregate plant

Acme-Hamilton conveyor belting, nearly a mile of it on 16 Barber-Greene conveyors, carries aggregate from the pit to this washing, crushing and screening plant, stockpiles the different products, then loads them on barges. 4 men operate the entire plant! Impossible without dependable, trouble-free conveyors and Acme-Hamilton belting.

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Model 480 Michigan does push-loading job normally requiring two big track-mounted machines working in tandem.

600 hp Michigan, stripping uranium overburden,

push-loads 30 yds: 48 seconds

Pushing singly, this giant Michigan Dozer regularly heaps 30 yard scrapers *in 48 seconds!*

Its high speed of pushing, back-up, and positioning enables the huge Michigan, *by itself*, to handle loading of five of these big pans on cycles as short as 2,000 feet.

Its job is on a 5,000,000 yard per year stripping contract for Lucky Mc Uranium Corporation, on their property east of Riverton, Wyoming. Material varies from tight hardpan to loose sand and gravel. Company officials chose the 52 ton, 600 hp rig, biggest of four Michigan Dozers available (the others: 165, 262, 375 hp), for both pushing and pit-floor dozing.

In normal pusher operation, the big Michigan works in a cut 50 to 80 ft deep, 600 ft wide. As each scraper drops its pan, torque converter-equipped Michigan makes smooth contact, drives ahead in second gear. Detailed time studies, covering over 300 loads and made under a wide range of temperature and weather conditions, show the scrapers heaped and on their way in *an average of 48 seconds*. Loads scale out at an average of 30 loose, 23.6 bank yards! With Michigan's power shift providing instant change of speeds and direction, back-up and positioning time average only another 25 to 30 seconds per scraper. Boosting load out of cut takes 4 seconds. Scraper output, with the Michigan pushing, regularly averages 38 loads (894 bank yards) per 50-minute working hour.

The Michigan's 28½ mph speeds on rubber make it a natural for handling scattered emergency tasks and occasional fill dirt dozing, too.

If you have similar big-yardage scraper or dozer jobs, perhaps this big mobile Michigan can give *you* similar cost-cutting advantages. It will cost you nothing to find out. Just call your local Michigan Distributor (or us) for a detailed on-your-job analysis and possible test demonstration.

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"Not one broken bag with WONDERWALL®!"

"The biggest breakage problem in our plant had been when bags were moved from one place to another by cart or hand truck. Now, with WONDERWALLS we've eliminated that problem. Three thousand tons of meal are packed in 100,000 50-pound WONDERWALLS because they do the job," Mr. Paulson says.

"WONDERWALLS stack—and stay stacked," reports Mr. Paulson. "Bags don't slip when they're piled one on top of the other. This is a great advantage from the hauling standpoint. There's no shifting in the truck or railroad car as a result of quick starts and stops. They just seem to conform to each other. WONDERWALLS stay that way until they're unloaded."

"Since we started using WONDERWALLS, we've never had a broken bag! When we were using regular kraft, we'd send out a truckload of alfalfa meal and we'd get back 10 or 12 broken bags every time. WONDERWALLS changed all that," reports H. A. Paulson, Owner, Paulson Dehydrated Products Company, Luverne, Minnesota.

An unusual case history? Quite the contrary—it's typical! Everywhere that WONDERWALLS are put to work, the report is essentially the same:

WONDERWALLS *reduce breakage in a big way or eliminate it altogether.*

WONDERWALLS outperform ordinary bags because they're made of Clupak* kraft—the remarkable paper with the built-in stretch. Result: WONDERWALLS stand up under the rough and tumble punishment that breaks ordinary multiwalls. That's not all. WONDERWALL bags pack faster, handle easier and stack better. And save you money. There is no other bag on the market today that can match WONDERWALL performance.

Best of all—WONDERWALLS cost no more.

Try this new, superior multiwall. Order a trial shipment of 5000 WONDERWALLS on your next carload. Write Multiwall Bag Division, West Virginia Pulp and Paper Company, 230 Park Ave., New York 17.

Clupak, Inc's. trademark for extensible paper manufactured under its authority.

See it at our exhibit,
AMA Packaging Exposition, Chicago

West Virginia Pulp and Paper

News of the Industry

Finish-Grinding Department At Glens Falls Portland Offers 2 Separate Circuits

Construction of a new $3,000,000 finish grinding department will give the Glens Falls (N. Y.) Portland Cement Company one of the most modern clinker-grinding facilities in the industry. Scheduled for completion late in 1959, the modernization program will improve the capacity and efficiency of the grinding operation.

Allis-Chalmers is furnishing all the equipment for the new department. This includes two 1034 Compeb mills with 1500-hp. motors, materials-handling equipment, air separators, dust collectors, numerous motors with related electrical control, 115-kv. outdoor-type oil circuit breaker with 5000-mv.-a. interrupting capacity, 10,000/12,500-kv.-a. transformer, and an outdoor substation with metal-clad switchgear.

Burt M. Keene, vice-president in charge of production for Glens Falls Cement Company, said the old finish-grinding eqiupment will continue to be operated until completion of the new 65- by 100-ft. building. Featured in the new addition will be two separate grinding circuits. These will permit simultaneous production of two types of cement.

A. P. Green Fire Brick Co. To Erect $2,000,000 Plant

William S. Lowe, president of the A. P. Green Fire Brick Company, Mexico, Mo., has announced plans for the construction of a new $2,000,000 plant for the manufacture of basic refractories at Tarentum, Pa., about 20 miles northeast of Pittsburgh.

Construction at Tarentum is expected to start as soon as engineering and erection plans have been completed. The first unit of construction will consist of about 50,000 sq. ft. under roof, and space has been allowed for expansion.

A full line of basic refractories consisting of magnesite, magnesite-chrome, chrome-magnesite, and chrome products will be produced here. Also included is a complete line of basic specialty refractories including bonding mortars, plastics, castables, and ramming mixes.

William G. Maloney, superintendent of service departments, from the main office at Mexico, has been appointed plant manager. He will take over his duties during the construction of the plant and installation of equipment.

Dallas Lightweight Aggregate Acquired by Texas Industries

Texas Industries, Incorporated, Dallas, has acquired the Dallas Lightweight Aggregate Company, according to Ralph B. Rogers, president of Texas Industries.

Dallas Lightweight Aggregate, which is now a wholly-owned subsidiary of Texas Industries, is the largest producer of lightweight aggregate in the North Central Texas area.

Pacific Building Materials, Readymix Concrete Co. Bought by Glacier S.-G. Co.

The purchase of Pacific Building Materials Company and Readymix Concrete Company of Portland, Oreg., by Glacier Sand and Gravel Company of Seattle, was announced recently by spokesmen of the latter concern.

Substantially all assets of the two Portland firms, including two sand-and-gravel plants in Portland and three ready-mix plants—two in Portland and one in Vancouver, Wash.—were involved in the transaction. The purchase price was in excess of $1,500,000.

Melvin Erland, former president and general manager of Pacific Building Materials Company, will remain in charge of both divisions.

Glacier Sand and Gravel is a wholly-owned subsidiary of the Permanente Cement Company.

Coming Events

March 11-14, 1959—Palm Beach. 51st annual convention, American Concrete Pipe Association. Palm Beach Biltmore.

April 6-8, 1959 — Hot Springs, Va. 51st annual convention, National Lime Association. The Homestead.

April 21-22, 1959—Niagara Falls, N. Y. Plant operators meeting, National Slag Association. Treadway Inn.

June 8-9, 1959—Chicago. Mid-year meeting, National Agricultural Limestone Institute, Inc. Sheraton-Blackstone Hotel.

June 8-9, 1959—Chicago. Mid-year meeting, National Crushed Limestone Institute. Sheraton-Blackstone Hotel.

June 21-26, 1959—Atlantic City. Annual meeting, American Society for Testing Materials. Chalfonte-Haddon Hall.

December Building Volume Shows 15 Percent Rise—1958 Total Sets New High

Contracts for future construction in the United States in December rose 15 percent above that of December, 1957, according to the F. W. Dodge Corporation. The December contracts amounted to $2,281,881,000, bringing the annual total for 1958 to an all-time high of $35,089,703,000. This was the eleventh consecutive record year.

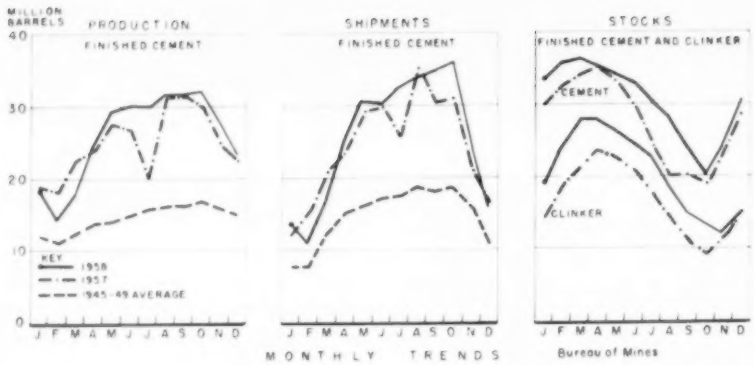
According to George Cline Smith, Dodge vice-president and economist, the most remarkable feature of the 1958 contracts was the sharp rebound that began in April after a poor first quarter. "Despite a substantial decline in the early part of the year," he stated, "contracts for future construction in the later months not only recovered the ground that was lost but also set new all-time highs on several occasions and wound up with an annual total of a full 9 percent greater than the previous record in 1957. These gains in the country's largest fabricating industry played an important role in reversing the nationwide recession and supporting the current recovery."

In December, all the major construction categories showed gains, but as in other recent months, most of the strength was in the residential sector. December contracts for residential buildings were valued at $981,012,000, an increase of 29 percent over the December, 1957, level. The number of dwelling units represented by the residential contracts totalled 79,263, up 36 percent over the previous December. Sharp gains were recorded for one- and two-family homes, as well as for apartment units.

Contracts for non-residential buildings in December amounted to $747,555,000, a gain of 7 percent over December, 1957. Contracts for commercial buildings, schools, and public buildings scored the largest gains, while manufacturing buildings continued well below the year-earlier levels.

Heavy engineering contracts in December totalled $553,314,000 up 5 percent from December, 1957. Contracts for utilities dropped, but this trend was more than offset by substantial gains in public works, particularly highways.

For the year 1958 as a whole, residential building contracts amounted to $14,695,531,000, up 13 percent over 1957; non-residential building at $10,948,334,000, was down 3 percent; and heavy engineering at $9,445,838,000, was up 20 percent.



PRELIMINARY 1958 SUMMARY—As reported to the U. S. Bureau of Mines, production of portland cement increased 5 percent and shipments 6 percent in 1958, to 311,319,000 bbl. and 307,040,000 bbl., respectively, over the 1957 figures. Shipments were less than 1 percent below the record high of 308,767,000 bbl. attained in 1956. Severe winter conditions in the first three months of 1958 prevented construction in general and resulted in a drop in production and shipments of portland cement compared to 1957, but during the rest of the year the industry showed consistent improvement over 1957.

Three new plants went into operation during 1958, one at Alpha, Md., and two at Miami, Fla. In addition, substantial increases in production capacities were reported at 14 plants during 1958, raising the total annual production capacity from 363,500,000 to 397,500,000 bbl. on December 31, 1958.

DECEMBER SUMMARY—Production of finished portland cement in December, 1958, as reported to the Bureau of Mines, totaled 23,590,000 bbl., an increase of 5 percent over December, 1957. Mill shipments in December, 1958, totaled 16,623,000 bbl., a decrease of 1 percent from December, 1957. Stocks of 30,459,000 bbl. of finished portland cement on hand December 31, 1958, were 6 percent more than those on hand December 31, 1957. Clinker production during December, 1958, totaled 27,029,000, an increase of 4 percent over the December, 1957, figure.

PRODUCTION—One hundred and sixty, (160) plants in 37 states and Puerto Rico reported a production of 23,590,000 bbl. of finished portland cement during December, 1958, compared with 22,386,000 bbl. in December, 1957.

Clinker production during the month of December, 1958, was 27,029,000 bbl. compared with 26,008,000 bbl. during the same month in 1957.

High-early-strength portland cement production in December, 1958, totaled 1,676,000 bbl., a decrease of 2 percent from the December, 1957, production.

Production of prepared masonry cement during December, 1958, of 1,021,000 bbl. decreased 4 percent from the December, 1957, figure.

SHIPMENTS—Mill shipments of finished portland cement for December, 1958, totaled 16,623,000 bbl., while in December, 1957, 16,834,000 bbl. were shipped.

In December, 1958, shipments were higher in 11 districts and lower in 12 districts than in December, 1957. The largest increases were in northern and southern California districts and the greatest decreases were in Illinois, Ohio, and Michigan districts.

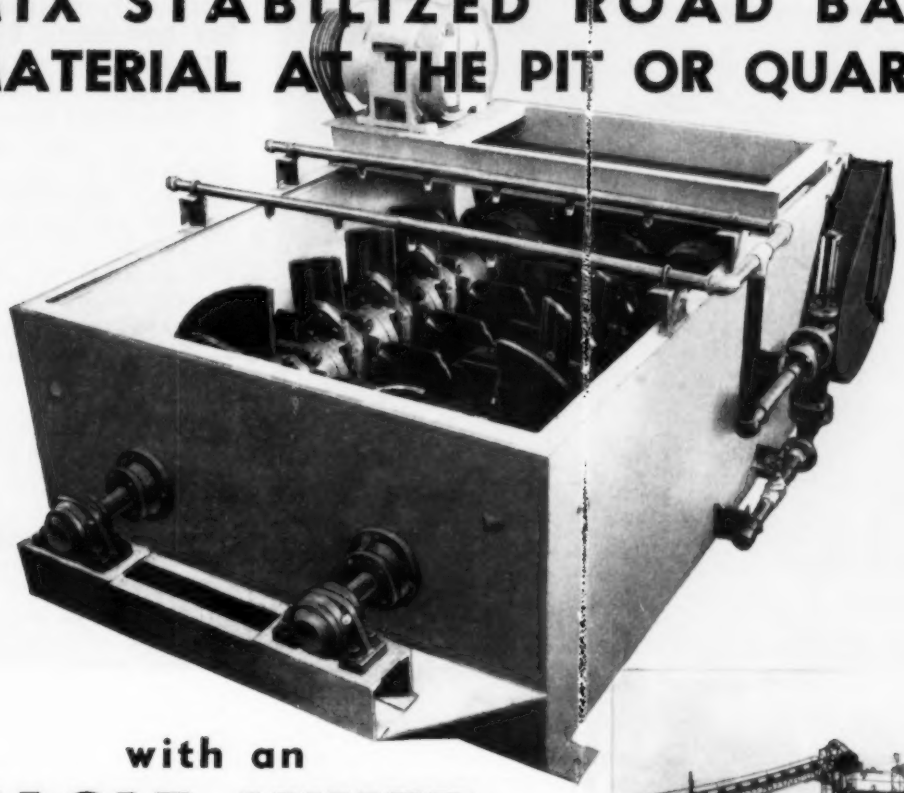
Mill shipments of high-early-strength portland cement totaled 957,000 bbl. in December, 1958, an increase of 7 percent over the 891,000 bbl. shipped in December, 1957.

Mill shipments of prepared masonry cement in December, 1958, totaled 746,000 bbl., an increase of 1 percent over the 738,000 bbl. shipped in December, 1957. Two-thirds of these shipments were from mills in the northern states east of the Mississippi River. Prepared masonry cements are shown in 376-lb. barrels, although they are sold in barrels of varying weights.

STOCKS—Mill stocks of finished portland cement on hand December 31, 1958, totaled 30,459,000 bbl., an increase of 6 percent over the 28,729,000 bbl. on hand December 31, 1957. Stocks of clinker increased 4 percent from 14,853,000 bbl. on hand December 31, 1957, to 15,429,000 bbl. on hand December 31, 1958.

12 MONTHS OF 1958—For the January-December period of 1958, the volume of production of finished cement amounted to 311,319,000 bbl., compared with 297,801,000 bbl. in the same period of 1957. Total shipments for the twelve months of 1958 are reported as 307,040,000 bbl.; in 1957 (January-December period) the total shipments were 289,110,000 bbl.

MIX STABILIZED ROAD BASE MATERIAL AT THE PIT OR QUARRY



with an EAGLE MIXER

A BETTER QUALITY of stabilized road base material can be produced at the quarry or pit with an EAGLE MIXER. A far more thorough mixing action is provided than by mixing materials in-place on the right of way. Optimum moisture means quick compaction—more and more highway contractors are seeking plant-mixed stabilized road base material. This is an extra source of revenue to aggregate producers.

The EAGLE MIXER consists of a tub with rows of opposing paddles on two tubular steel shafts. The paddles not only thoroughly mix and blend the materials, but convey them toward a discharge opening at the same time. Mixer can be erected over a bin or hopper with clamshell gates or mounted at an elevation for discharging directly into trucks. Mixer can be equipped with spray bars and water metering system, as optional equipment.

The EAGLE MIXER blends fine and/or coarse aggregate with required additives and water. Better dispersion of all elements throughout the mixture is assurred—mixes any road base materials for supporting asphaltic or concrete pavement. These rugged units are available in four sizes; capacities of 125 to 500 t.p.h. Get the facts—send for Bulletin 1258 today!

Eagle Stabilized Road Base Mixer at Louisville Crushed Stone Co., Louisville, Ky.

Eagle Mixer blending coarse sand, clay and water for road base at a Kansas aggregate plant.

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Offers ***Lower first cost—less maintenance • Easier installation • Self-training • Higher capacity—less spillage!***

In this unique design, the wire rope is located below the carrying belt and carrying idlers and the motion of the belt rocks the idlers in the direction of belt travel to provide automatic self-training. This feature, combined with the belt's deep 27° troughing angle, keeps the load centered at all times, materially reduces spillage, makes possible wider spacing between idlers, and provides high carrying capacity. Adjustable height "Platform Rocker" rope support stands minimize blocking and level belt automatically.

There are other reasons why it will pay you to use the LONG Lo-Rope Conveyor. This unit requires an absolute minimum of maintenance and is designed to give long, dependable service under all conditions. We'll be glad to send complete details without obligation.

For full information on LONG Lo-Rope Belt Conveyors or a demonstration, write us today

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Oak Hill, W. Va.
Company

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● R. W. Holub, Concrete Materials & Construction Company, Cedar Rapids, Iowa, who was elected president of the Missouri Limestone Producers Association at the 14th annual meeting of that organization. Mr. Holub is field representative for his firm's plants in southern Iowa and northern Missouri.

November Lime Sales Decline In All Major Categories

Domestic sales of open-market lime in November, 1958, (692,703 short tons) decreased compared to the previous month's output, according to reports released by producers to the U. S. Bureau of Mines.

Decreases were noted in all major categories. (Note the accompanying table.)

Pa. Stone Producers Assn. Meet in Harrisburg For Addresses, Discussions

On January 22 the Pennsylvania Stone Producers Association met at the Penn Harris Hotel in Harrisburg for the annual meeting and open session.

During the afternoon the members were addressed by the following speakers: William J. Anderson, Pennsylvania Highway Testing Laboratory; J. Fred Coleman Jr., chairman technical committee; Howard M. Bixby, field engineer, National Crushed Stone Association; C. D. Jensen, director (research and testing), Pennsylvania Highway Testing Laboratory; and Dr. Marlin L. Sheridan, professor of engineering, Bucknell University.

These speakers discussed antiskid material, skid prevention, stone sand and its properties and uses, highway research, and specifications for special subgrade materials and stabilized shoulders.

American-Marietta Earnings Top Previous Records in '58

Earnings of American-Marietta Company for the year ended November 30, 1958, exceeded all previous records. Net sales for the 1958 year reached $251,417,000, an increase of 7.4 percent over sales of $234,038,408 for the prior year.

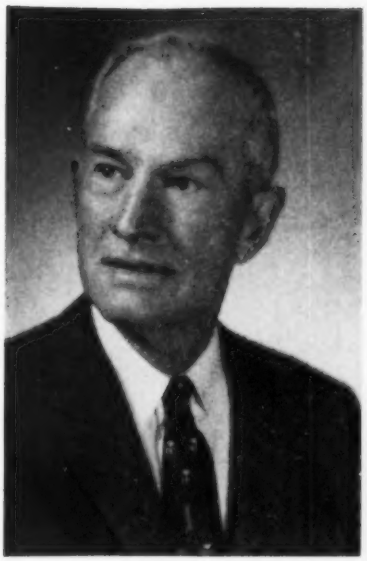
Net income in 1958 rose to an all-time high of $17,581,005, compared to net income of $17,182,701 reported for the 1957 fiscal year.

Lime Sold by Producers in the United States, in Specified Periods of 1957-58, by Types and Major Uses in Short Tons

	October 1958	November 1958	November 1957	January-November 1958	January-November 1957
By types:					
Quicklime	598,679	533,748	550,933	5,267,924	6,608,876
Hydrated lime	174,496	158,955	139,557	1,749,519	1,731,437
Total[2]	773,175	692,703	690,490	7,017,443	8,340,313
By uses:					
Agricultural:					
Quicklime	4,953	3,619	11,624	49,999	80,211
Hydrated lime	8,040	5,332	6,787	111,339	131,578
Total	12,993	8,951	18,411	161,338	211,789
Construction:					
Quicklime	12,242	12,655	12,433	124,105	163,328
Hydrated lime	86,417	77,208	68,675	853,437	842,663
Total	98,659	89,863	81,108	977,542	1,005,991
Chemical and other industrial:					
Quicklime	376,027	349,778	355,544	3,584,657	4,219,091
Hydrated lime	80,039	76,415	64,095	784,743	757,196
Total	456,066	426,193	419,639	4,369,400	4,976,287
Refractory (dead-burned dolomite)	205,457	167,696	171,332	1,509,163	2,146,246

[1] Also includes a small quantity of captive tonnage. The monthly canvass excludes the output of plants producing less than 10,000 tons a year.

[2] Approximately 60 percent of lime produced is high-calcium and 40 percent high-magnesium.



Earl D. Stearns

Retirement of E. D. Stearns Ends Brilliant 50-Year Career

Earl D. Stearns, who was general sales manager and manager of the Conveyor Division of Barber-Greene Company, retired recently after a 50-year career in the conveyor industry. He had been associated with Barber-Greene since 1933.

From 1909 to 1933 Mr. Stearns was affiliated with various conveyor firms. He was the founder and president of his own concern, the Stearns Conveyor Company, from 1921 to 1928.

Empire State S.G.-R.M.A. To Meet in Niagara Falls, Ont.

Plans for the 8th annual convention of the Empire State Sand, Gravel and Ready Mix Association are being made, and the dates and location have been announced. Headquarters will be the Sheraton-Brock Hotel, Niagara Falls, Ont. The sessions will be held on May 17-19.

One special event scheduled will be an inspection trip to the Niagara Falls project of the New York Power Authority, now under construction. This project, when completed, reportedly will be the largest electric power plant in the world.

The fifth annual convention of the Texas Aggregates Association and the Texas Ready Mixed Concrete Association will be held at the Shamrock Hilton Hotel, Houston, Tex., April 23 to 25.

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Welded Steel Pulleys with "TAPER-LOCK"® HUBS

Continental Welded Steel Pulleys are furnished with "Taper-Lock" Hubs and bushings — giving the equivalent of a shrunk-on fit while permitting easy assembly and disassembly.

Welded steel construction combines maximum strength with minimum weight, and also excludes dirt and water.

For further information on Welded Steel Pulleys write for Bulletin ID-134.

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BEST BUYS IN NEW AND USED EQUIPMENT

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J. E. Kennedy, Industrialist, Kennedy-Van Saun Founder, Dies After Colorful Career

Joseph E. Kennedy, 95, founder and chairman of the board of the Kennedy-Van Saun Manufacturing and Engineering Corporation, New York, N. Y., and Danville, Pa., died on January 9 at his home in New York. Mr. Kennedy was one of the oldest active industrialists in the United States.

Starting his business career at the early age of 20, he opened a hardware and farm implement business in Grand Rapids, Mich. This venture proved so successful that Mr. Kennedy was able to retire before his 30th birthday. His business inactivity lasted less than two weeks, however. He was urged to pinch hit for a friend, selling crushers and mining machinery. Later named eastern manager of the Austin Company, Mr. Kennedy achieved considerable success. From Austin, Mr. Kennedy went with the Power and Mining Machinery Division of the Guggenheim Copper Company.

In 1907 Mr. Kennedy started his own business in New York City. And in 1916 he purchased the Old Danville Iron & Steel Plant in Danville, Pa. At that time the property comprised 1½ acres and four buildings. Today the plant covers more than 16 acres of floor space with 36 buildings, and Kennedy machinery is installed in important cement, lime, mining, and power plants all over the world.

Joseph E. Kennedy

Mr. Kennedy had over 1,000 patents in his name, and even when he was well over 90, he was working on other inventions. The company continues under its present management with offices at 405 Park Avenue, New York, and the factory at Danville, Pa.

Permanente Cement Company Establishes Plant on Guam

Permanente Cement Company has established a cement distribution facility on the Western Pacific island of Guam, it was announced in Oakland, Calif. recently by Wallace A. Marsh, vice-president and general manager.

The $250,000 plant, located near Apra Harbor on land leased from the Navy, will have a storage capacity of 60,000 bbl. of cement, and will be equipped to provide both sacked and bulk cement. Cement will be shipped directly from Permanente shipping facilities at Redwood City or Long Beach, Calif.

Highway Material Producers Of Pennsylvania Convene

The Pennsylvania Highway Material Producers Conference was held on January 22 and 23 at the Penn Harris Hotel in Harrisburg.

Speakers included the following: Governor David L. Lawrence, Park H. Martin, secretary of highways; Andrew M. Bradley, secretary of property and supplies; William L. Batt, secretary of labor and industry; Robert A. Farley, chief engineer, highways; Edwin H. Jones, chief engineer, maintenance (highways); Francis C. Witkoski, assistant director (research and testing) Highway Laboratory; John F. Dwyer, director of Bureau of Inspection, Pennsylvania Department of Labor and Industry; and John L. Stinson, district engineer, Bureau of Public Roads.

Some of the topics covered were state procurement problems, industrial safety, the state highway program, highway maintenance, and the use of explosives.

Robert J. Stuart has been promoted to sales manager of the Pittsburgh division of the Medusa Portland Cement Company of Cleveland.

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CATERPILLAR'S PROJECT PAYDIRT

PROJECT PAYDIRT *pays off for you again*

NEW Caterpillar No. 933 Series F Traxcavator delivers up to 22% more production

The new Caterpillar No. 933 Series F Traxcavator with a larger, 1⅛ cu. yd. bucket is ready now to set new production records. It is the latest achievement of Caterpillar's "Project Paydirt*."

Field tests on a variety of jobs and working conditions proved the new Series F delivers *up to 22 per cent more production* than previous models of this popular machine.

The power source of the new No. 933 is an efficient new 52 HP Cat Diesel Engine. It features a new cylinder block, engine balancer for smooth performance, unit-serviced fuel pump, and a side-mounted starting engine for compactness and economy.

A new transmission and a heavier final drive give the new No. 933 the speed and stamina to maintain quick, easy loading and faster cycling. Cycle time is further shortened by a high-speed reverse—3.67 MPH.

The new machine features greater operator comfort and efficiency. All controls are conveniently visible. Leg room is ample. The mechanical advantage of the steering clutch brakes has been increased 30% for easier operation. A new, larger seat is more comfortable, continues to provide good visibility, both front and back.

And the new No. 933 retains the superior design features that have made Traxcavators first choice on jobs throughout the world. The exclusive oil clutch, automatic bucket controls, 40° tilt-back, heavy-duty undercarriage, unit design and construction — to name just a few. And the exclusive Side Dump Bucket is available to add versatility.

Get the complete story on the new No. 933 from your Caterpillar Dealer. Ask him to demonstrate how this Traxcavator can step up production on your job.

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HIGHER PRODUCTION and more profits are possible with the new Caterpillar No. 933 Series F Traxcavator featuring a 1⅛ cu. yd. bucket.

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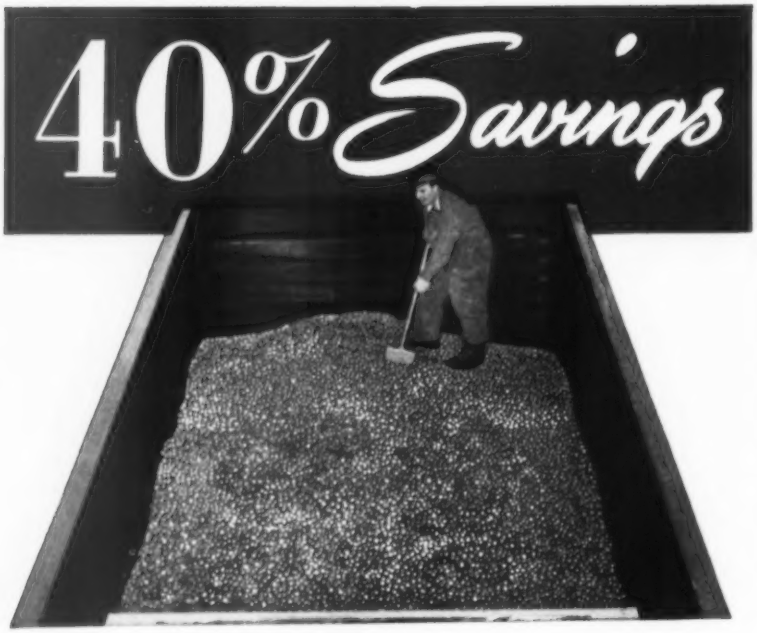
BORN OF RESEARCH PROVED IN THE FIELD



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A full year of on-the-job tests proved that, in wet grinding of copper ore, Calumet Ni-Hard grinding balls offered more than 40% reduction in grinding ball costs per ton of ore ground. In dry grinding, equally impressive results were shown.

These are the grinding balls developed to meet Calumet's own requirements for abrasion resistance and lowest possible grinding costs. Through careful quality control and laboratory testing, all Calumet Ni-Hard grinding balls provide the uniformity that will assure you of exceptionally satisfactory use in your grinding operations.

Calumet Ni-Hard grinding balls are available from stock in the following sizes: 5/8", 3/4", 7/8", 1", 1 1/4", 1 1/2" and 2". Complete information is yours for the asking. Write TODAY.

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Carolina Solite Corp. Adding Kiln at Aquadale To Increase Solite Output

Carolina Solite Corporation, a wholly-owned subsidiary of the Southern Lightweight Aggregate Corporation, has announced the construction of an additional kiln at the firm's Aquadale, N. C., plant. In this type of revolving kiln, the raw material of Solite is fired at temperatures up to 2,300 deg. F.

This new addition at Aquadale will increase production to equal that of Solite's Bremo Bluff, Va., plant, now the world's largest producer of lightweight aggregate.

Southern Lightweight Aggregate will open a new plant in Green Cove Springs, Fla., in April, 1959. Company offices, under the auspices of Florida Solite Corporation, have been opened in Jacksonville, with George Jones as Florida representative. The company also maintains a plant in Leaksville Junction, Va., and offices in Columbia, S. C., Charlotte and Raleigh, N. C., and Bethesda, Md. Home offices are in Richmond, Va.

Gibsonburg Lime Products To Install Another Rotary Kiln

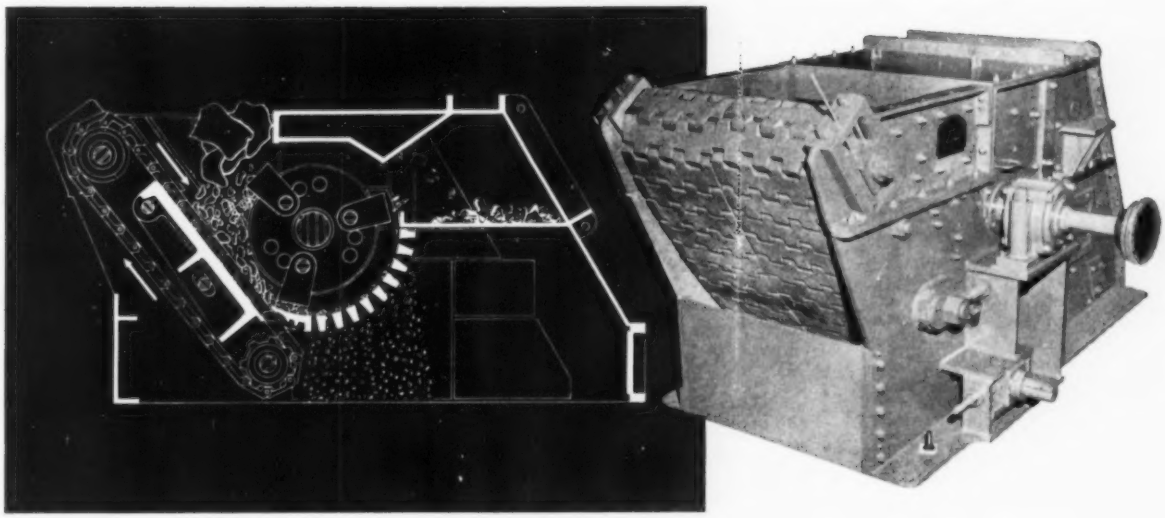
W. H. Price II, vice-president of the Gibsonburg Lime Products Company, Gibsonburg, Ohio, has announced that the board of directors has approved the installation of an additional rotary kiln that will produce 240 tons of dolomitic lime per day.

The installation, in addition to the rotary kiln, will include stone-handling equipment and additional storage, preheater, cooler, and complete grinding, screening, and loading facilities.

The completion of construction is scheduled for October 1, 1959.

Kennedy Van Saun Manufacturing and Engineering Corporation of New York will act as engineers and furnish certain major items of equipment.

WADE W. HILDINGER, vice-president of the National Gypsum Company, Buffalo, N. Y., has been elected second vice-president of the Better Business Bureau of Western New York.



FOR CRUSHING WET AND STICKY MATERIALS

If you're bothered with plugging and time lost getting the mill clear, here's the crusher that'll do away with your troubles. It's the Pennsylvania Non-Clog Hammermill. When in operation the traveling breaker plate carries the feed into the path of the hammers at a fixed rate of speed, making it impossible for the sticky feed to build up on the breaker plate out of reach of the hammers. In extreme wet feed conditions, where frequent clean-outs in the rear of the crusher may be necessary, the Non-Clog can be equipped with a self cleaning device. For complete information on the Pennsylvania Non-Clog Hammermill, send for bulletin 1052. Pennsylvania Crusher Division, Bath Iron Works Corporation, West Chester, Pennsylvania.

Pennsylvania CRUSHERS

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● This Marion aluminum frameless dump trailer halls 24 tons legally over Ohio highways for Anderson Concrete Corporation, Columbus, Ohio. Used primarily to stock Anderson's batching plants, it is equipped with a powerful front-end telescopic hoist, model F-815-T-204. The 34 ft.-6 in. hopper trailer hauls aggregate and has a payload of 47,600 lb. It has air-actuated clamshell doors and is powered by a Reo A-633.

F. W. McMillin Is Victim Of Fatal Auto Accident

Frederick W. McMillin Jr., 58, president of Genesee Stone Products Corporation and Genesee Bituminous Products Corporation, Stafford, N. Y., and Batavia (N. Y.) Washed Sand and Gravel Company, died on January 25. His death was caused by injuries incurred when his auto skidded and plunged over an embankment into a quarry of the Genesee Stone Products Corporation.

Mr. McMillin has been previously associated with the Federal Cement Company and had been a vice-president of the McClain Construction Company of Buffalo.

Deely of Lee Lime in Korea To Survey Building Materials

John M. Deely Jr., of Yale Hill, Stockbridge, Mass., vice-president of the Lee Lime Corporation, left recently for South Korea. He will be a member of a team which will survey indigenous building materials available to that country.

The project is being financed jointly by both countries under a program of economic assistance to underprivileged areas. The United States State Department is in charge.

The four-man team is expected to be in Korea for eight weeks. On the basis of their observations and studies, members of the team will prepare a report on raw materials, quality, methods of manufacturing, marketing, and uses of building materials in South Korea. The report will be submitted to both governments.

Vulcan Materials Company To Buy Quarry Firms— Hedrick Named Sales Mgr.

Vulcan Materials Company, Birmingham, Ala., has signed agreements to purchase Piedmont Quarries of Winston-Salem, N. C., Pioneer Quarries Company of Stokesdale, N. C., and Greystone Granite Quarries Incorporated of Henderson, N. C.

H. D. Hedrick of Henderson, formerly president of Graystone Quarries Incorporated, will be in charge of sales for Vulcan from the Greystone, Piedmont, and Pioneer operations.

50-Year Service Honored By Natl. Lime & Stone Co.

Roy Joseph, superintendent of the National Lime and Stone Company, Lima, Ohio, was recently awarded a month's vacation in Florida by that firm in recognition of his 50 years of service.

Mr. and Mrs. Joseph attended the National Crushed Stone Association's annual convention in Miami, where Mr. Joseph received a national safety award on behalf of the Lima, Buckland, Rimer, and East Liberty, Ohio, plants.

40th Convention of A.E.D. Attracts 4,000 to Chicago

The 40th annual meeting of the Associated Equipment Distributors, held January 25-29 at the Conrad Hilton Hotel in Chicago was attended by more than 4,000 men of the industry and their wives. Morning business sessions, and informal afternoon conferences comprised the business program. The Early Birds breakfast on Monday morning and A.E.D.'s 40th Birthday party on Tuesday evening highlighted the social events.

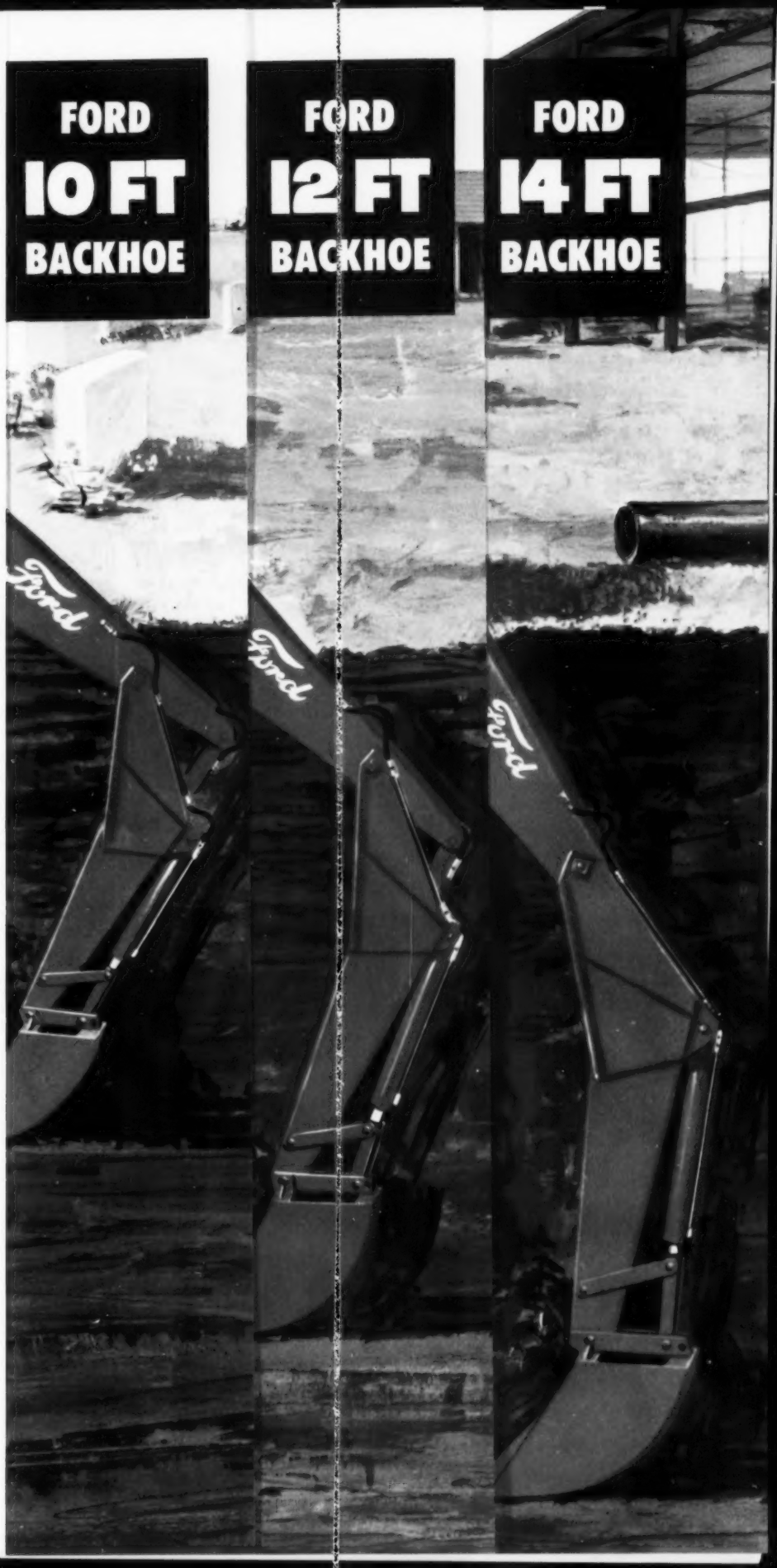
H. D. Anderson (Rish Equipment Co., Bluefield, W. Va.) gave an analysis of business conditions based on his experience as A.E.D.'s president during 1958. Allan Coe (Finning Tractor and Equipment Co., Ltd., Vancouver, B. C.) and Dr. William G. Van Note (president, Clarkson College of Technology, Potsdam, N. Y.) spoke on used equipment merchandising and construction equipment distribution.

T. Coleman Andrews, former U. S. Commissioner of Internal Revenue, talked on the effect of spending, high taxes, and inflation on the common man, as well as on business. *Manpower, Management, Market, and Money* was the subject discussed by distributor executives.

A.E.D. national officers chosen for 1959 are as follows: president—F. J. Fitzpatrick (Parker-Danner Co., Hyde Park, Mass.); executive vice-president—J. A. Benson (Benson Tractor Co., Houston, Tex.); vice-president—H. J. Mayer (Western Machinery Co., San Francisco, Calif.); vice-president—R. F. Newlin (Newlin Machinery Corporation, Kansas City, Kans.); Canadian vice-president—J. A. Young (R. J. Fyfe Equipment, Ltd., Regina, Sask.); and treasurer—Braxton Blalock Jr. (Blalock Machinery and Equipment Company, Incorporated, Atlanta, Ga.).

Enter 33 on card, page 139 →

ALL NEW FROM FORD FOR '59



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THE LINE FOR '59

Get detailed information on:

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NEW FORD INDUSTRIAL TRACTOR

NEW FORD SUPER-DUTY LOADER

NEW FORDSON POWER MAJOR DIESEL

SEE YOUR FORD TRACTOR AND EQUIPMENT DEALER TODAY

or write to Industrial Sales Department, Tractor and Implement Division, Ford Motor Company, Birmingham, Michigan.

YOU SEE MORE

FORDS

BECAUSE THEY SAVE MORE MONEY!

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ALL FORDS ARE ENGINEERED FOR:

- ***Fast Digging***

  Long reach, free drop, unmatched bucket capacities, positive swing and boom control, Ford's exclusive placement of pivot points and hydraulic cylinders—all work together for faster production and greater lengths of trench from a single setting.

- ***Precision Digging***

  Instant, accurate control of boom, dipstick and bucket lets you hold trench floors to exact grade, dig plumb walls and square corners, work around underground lines, reduce costly hand finishing.

- ***Problem Digging***

  Wide-stance stabilizers and full-power 185° swing are among the many superior Ford features which help you undercut paved surfaces, dig at full speed on slopes or at right angles, work close to buildings, in cramped quarters, on soft ground.

FORD 10 FT. BACKHOE

Dimensional specifications with Ford Workmaster Tractor

Transport length: 17′1″

Transport height: 10′4″

Seat to ground: 54″

Axle to swing post: 3′2″

Max. reach from axle: 17′4″

Reach, pivot to bucket teeth: 14′2″

Max. undercut forward of pivot: 5′7″

Reach outside tire @ 90°: 11′6″

Hydraulic pump capacity: 14 gpm @ 1700 rpm

Stabilizer, lift, bucket and crowd cylinders (double acting): piston 3″ dia., rod 1¾″ dia.

Swing cylinders (single acting): piston 3½″ dia., rod 1½″ dia.

Features offered by all Ford 10′, 12′ and 14′ backhoes are listed on last page.

FORD 10 FT. COMPARISON CHART

FEATURE	FORD 10′	BACKHOE A	BACKHOE B
Max. length 40″ excavation	**14′3″**	11′1″	11′
Max. digging depth	**10′8″**	9′8″	9′8″
Max. reach from swing post	**14′2″**	12′4″	13′
Max. swing	**185°**	140°	180°
Max. loading height	**9′5″**	7′4″	8′6″
Ground clearance	**13½″**	10″	6″
Max. stabilizer spread	**120″**	78″	83″
Min. stabilizer spread (transport)	**77″**	77″	84″
Approx. weight (installed with bucket)	**2397 lbs.**	2110 lbs.	1725 lbs.
Struck capacity (cu. ft.)			
12″ ditching bucket	**2.5**	2.3	1.75
18″ ditching bucket	**4.5**	3.2	2.75
24″ ditching bucket	**6.0**	4.5	3.75

INTEGRATED HYDRAULIC PACKAGES

Ford backhoes use an integrated hydraulic system with front-mounted loaders; or are supplied with separate pump, drive and reservoir for tractors without loaders:

1. Ford 10′ Backhoe with Ford Extra Heavy Duty Loader on Ford NAA, 600, 601, 800 and 801 Tractors.
2. Ford 10′ and 12′ Backhoes with same loader on same tractors, but with bigger pump.
3. All Ford Backhoes with or without Ford Super-Duty Loader on Ford Industrial Tractors.
4. All Ford Backhoes without loader on Fordson Major Diesel and Fordson Power Major Tractors.

ALL FORDS ARE ENGINEERED FOR:

- ***5-Minute "Quick Hitch"***

  Ford has a clamp-type hitch, uses no pins or bolts. One man can put the backhoe on or off in minutes, right on the job. It takes no special tools or equipment. There's no interference with Ford's 3-point hitch. It's ready for work with commonly used rear tools as soon as the backhoe is removed.

- ***Unmatched Stability***

  Ford stabilizers are 10′ apart when working—widest stance on the market. Stabilizers retract without manual adjustment to 77″ width, carried high and close to tractor tires for transport and front loader work. Choice of five stabilizer plates—standard, sand, spike, street and special cemetery.

- ***Cushioned "No Drift" Swing***

  Short, single-link control of boom pivot helps keep swing system snug fitting, prevents swing drift. Automatic braking prevents slamming load into extreme swing limits in normal operations.

FORD 12 FT. BACKHOE

Dimensional specifications with Ford Powermaster Tractor

Transport length: 16′10″
Transport height: 11′5″
Seat to ground: 54″
Axle to swing post: 3′2″
Max. reach from axle: 19′
Reach, pivot to bucket teeth: 15′10″
Max. undercut forward of pivot: 5′10″
Reach outside tire (@ 90°): 13′1″
Hydraulic pump capacity: 14 gpm (@ 1700 rpm
Stabilizer, lift and crowd cylinders (double acting): piston 3½″ dia., rod 2″ dia.
Bucket cylinders (double acting): piston 3″ dia., rod 1¾″ dia.
Swing cylinders (single acting): piston 4″ dia., rod 1½″ dia.

FORD 12 FT. COMPARISON CHART

FEATURE	FORD 12′	BACKHOE C	BACKHOE D	BACKHOE E	BACKHOE F	BACKHOE G	BACKHOE H
Max. length 40″ excavation	**16′3″**	13′2″	11′	11′	12′4″	12′11″	11′8″
Max. digging depth	**12′5″**	11′	11′5″	11′5″	12′7″	11′6″	12′
Max. reach from swing post	**15′10″**	15′11″	13′10″	13′10″	15′7″	15′5″	14′4″
Max. swing	**185°**	180°	140°-180°	180°-200°	180°	180°	188°
Max. loading height	**10′7″**	10′	8′2″	7′11″	9′1″	7′5″	9′11″
Ground clearance	**13½″**	11″	10″	10″	N.A.	10″	12¼″
Max. stabilizer spread	**120″**	95″	86″	86″	102″	110″	98″
Approx. weight (installed with bucket)	**2685 lbs.**	N.A.	1900 lbs.	1900 lbs.	2095 lbs.	2969 lbs.	3001 lbs.
Struck capacity (cu. ft.)							
12″ ditching bucket	**2.5**	2.5	2	2	2	2	2
18″ ditching bucket	**4.5**	4	3	3	3.5	3.25	3.5
24″ ditching bucket	**6**	5.5	4.5	4.5	5	4.5	5

FORD 14 FT. BACKHOE

Dimensional and performance specifications with Ford Industrial Tractor

Transport length: 18′4″
Transport height: 12′7″
Seat to ground: 54″
Axle to swing post: 3′2″
Max. reach from axle: 20′8″
Max. undercut forward of pivot: 5′10″
Reach outside tire (@ 90°): 14′10″
Hydraulic pump capacity: 16.4 gpm (@ 1700 rpm
Stabilizer and bucket cylinders (double acting): piston 3½″ dia., rod 2″ dia.
Lift and crowd cylinders (double acting): piston 4″ dia., rod 2¼″ dia.
Swing cylinders (single acting): piston 4½″ dia., rod 2″ dia.
Max. length 40″ excavation: 16′2″
Max. digging depth: 14′1″
Max. reach from swing post: 17′6″
Max. swing: 185°
Max. loading height: 11′8″
Ground clearance: 13½″
Max. stabilizer spread: 120″
Min. stabilizer spread (transport): 77″
Approx. weight (installed w/bucket): 2905 lbs.
Struck capacity (cu. ft.)
12″ ditching bucket: 2.5
18″ ditching bucket: 4.5
24″ ditching bucket: 6.0
24″ high capacity ditching bucket: 7.0

NO FORD 14 FT. COMPARISON CHART

(there's never been anything approaching this model short of big expensive equipment)

ALL FORDS ARE ENGINEERED FOR:

- ***Four Major Lift Advantages***
  1. Power from largest side of piston on lift, when meeting most resistance.
  2. Straight-up transport position, better stability.
  3. Excellent dump height.
  4. Unmatched reach for undercutting forward of tractor rear axle.

- ***Four Major Crowd Advantages***
  1. Power from largest side of piston on crowd, when meeting most resistance.
  2. Excellent leverage provided through entire crowd stroke.
  3. Directs resistance force back to heavy boom, not to dipper stick.
  4. Permits combination of work actions for efficient, faster digging.

- ***Four Major Curl Advantages***
  1. Power from largest side of piston when curling bucket through ground resistance.
  2. Precise bucket positioning.
  3. Maintains high average tooth force during bucket rotation.
  4. Clean sweep action; no interference; no heel drag.

No matter what kind of HOLE, consider the WHOLE . . .

HERE ARE 55 EXCELLENT REASONS WHY A FORD BACKHOE WILL DO YOUR JOB BEST!

Quick Hitch

1. Close-coupled for good balance, stability.
2. Clamp-type hitch; no pins or bolts.
3. One man puts on or off in 5 minutes; no special tools.
4. Self-storing unit.
5. No need to disconnect pump drive; just connect uncoupled lines together and oil recirculates.
6. No interference with 3-point hitch; always ready for action.

Cool Hydraulic System

7. Clean design, shortest possible lines, no sharp bends. All help keep oil cool.
8. Ample oil capacity to provide full flow, maximum cycle speeds, and to prevent pump cavitation.
9. Six-spool multi-purpose body valve for top speed cycling, positive control, excellent throttling.
10. Main relief valve backed up by separate relief valves in hydraulic lift and crowd circuits.
11. No pipe, pipe threads or pipe fittings; all straight threads with "O" rings or tube fittings. Tight seal, easy service.
12. Minimum number of hose sizes to simplify owner maintenance.
13. All lines short as possible to reduce friction power losses.
14. Double acting cylinders throughout except for single acting swing cylinders.
15. All cylinders positioned for maximum force during stroke of greatest resistance.
16. Chevron type packing with phenolic resin back-up rings.

Rugged Construction

17. Backed up by Ford service warranty; one-stop parts and service; traditional good trade-in value.
18. Large replaceable pivot pins and case-hardened bushings at all wear points.
19. Hydraulic lines inside box members for protection where possible.
20. Control shroud cover easily removed to service plumbing.
21. Heavy duty swing post is shock resistant malleable iron casting.
22. Main swing pivot pins 1¾" dia.; special thrust washer in upper bearing resists wear from boom swing.
23. Boom, dipper stick and stabilizer arms all welded high strength box sections for maximum brawn, minimum weight.
24. Box section reinforcements at main pivot points of swing post, boom and dipper stick.

Operator Convenience

25. All models have adjustable, full-cushioned seat with back rest.
26. Plenty of leg room on anti-skid deck.
27. Superior work visibility.
28. Easy to reach tractor throttle, loader controls, etc. from seat of backhoe.

Unmatched Stability

29. Widest stabilizer stance on market.
30. Narrowest stabilizer transport width on market.
31. Individual control of stabilizers for leveling on slopes, uneven ground.
32. Wrist action pivot between each arm and stabilizer pad gives full ground contact.
33. Choice of five stabilizer pads to adapt for any type of work.

Superior Lift

34. Hydraulic power from big end of piston on lift stroke, when boom meets greatest resistance.
35. Free fall for speed and breaking ground.
36. Straight-up boom transport; closer to tractor center of gravity for stability.
37. Unmatched dump height.
38. Unmatched undercutting capacity.

Superior Crowd

39. Hydraulic power from big end of piston on crowd stroke, when dipstick meets greatest resistance.
40. Crowd force directed to lower end of dipper stick, near bucket pivot.
41. Cylinder location gives excellent leverage.
42. Resistance force transferred to heavy boom, not to dipper stick.
43. Crowd advantages are a vital part of Ford's over-all digging efficiency, permit faster production.

Superior Curl

44. Four-bar actuating linkage gives precise bucket positioning.
45. Hydraulic power from big end of piston when curling teeth through greatest resistance.
46. Maintains high average bucket tooth force.
47. Clean sweep action; no interference; no heel drag.

Biggest Bucket Capacities

48. Choice of 12", 18" and 24" standard ditching buckets; 24" high capacity ditching bucket for 14' model; 32" and 36" bell hole and cemetery buckets.
49. Replaceable wear points on teeth; bucket mouth flared to reduce friction.

Superior Swing

50. Positive, instant control; no delay getting bucket back into trench for another payload.
51. Fine throttling or feathering of swing control valve.
52. Combination flow and cushion valve maintains a solid oil circuit, prevents drifting.
53. Short, single-link connection between each cylinder and swing post; no chain or cable to wear excessively.
54. Short linkage reduces number of pivot points to four.
55. Retarding device on swing control lever automatically brakes swing to prevent slamming into stops. Operator can over-ride to get maximum swing.

Ask your Ford Tractor and Equipment Dealer for more detailed specifications and literature on these new backhoes as well as for all the other new tractors, loaders and matching equipment in Ford's new line for '59. See him today, or write to Ford Motor Company, Industrial Sales Department, Birmingham, Michigan.

YOU SEE MORE
FORDS
BECAUSE THEY SAVE MORE MONEY!

Design, materials and/or specifications are subject to change without notice and without liability.

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A.G.C. Convenes in Miami To Install New Officers, Discuss Highway Program

The Associated General Contractors of America, Incorporated, held their 40th annual convention at the Americana Hotel, Bal Harbour, Miami Beach, Fla., January 19-22. James W. Cawdrey (Cawdrey and Vemo, Seattle, Wash.) was installed as president of A.G.C. for 1959, and John A. Volpe, of Malden, Mass., is the new vice-president.

New officers of the three occupational divisions of A.G.C. are as follows:

Building Contractors' Division—Robert W. Long (Long Construction Company, Kansas City, Mo.), chairman; Carl W. Olson (Olson Construction Company, Lincoln, Nebr.), vice-chairman.

Highway Contractors' Division—J. B. Gibbons (Gibbons and Reed, Salt Lake City), chairman; H. L. Royden (Royden Construction Company, Phoenix, Ariz.), vice-chairman.

Heavy Construction and Railroad Division—Howard H. Sturdy (Dravo Corporation, Pittsburgh), chairman; Charles Keller Jr. (Keller Construction Company, New Orleans), vice-chairman.

A number of distinguished speakers addressed the various sessions, including Dr. Wernher von Braun, director of the development operations division of the Army Ballistic Missile Agency, and Victor Riesel, New York labor columnist.

The Highway Contractors' session was presented with information on the progress of the highway program and issues of concern to the highway construction industry. Among those who spoke were Bertram D. Tallamy, federal highway administrator; R. R. Bartelsmeyer, president of the American Association of State Highway Officials; and George F. McInerny, chief, Labor Compliance Branch, Bureau of Public Roads.

The Highway Division of A.G.C. unanimously approved a resolution urging the 86th Congress to enact legislation that would provide funds necessary to permit the continued orderly expansion of the primary, secondary, and urban road systems, and to permit completion of the national system of interstate and defense highways within the 16-year construction period contemplated by the Federal-Aid Highway Act of 1956.

Six-Month Shut-Down Ends As Ideal Plant Reopens

The San Juan Bautista (Calif.) plant of Ideal Cement Company resumed operations on January 1 after a six-month layoff period. The 40-year-old cement plant is the town's major industry.

Jack Baxter, plant manager, said the $5,000,000 facility will not be operating at full capacity until the end of the year. A slack market period last spring, plus a large stockpile of clinker, accounted for the closing.

The plant originally opened in 1919 and it was known as the San Juan Portland Cement Company. Later, it became the Old Mission Cement Company and then the Pacific Portland Cement Company. In 1952, Pacific and Ideal merged.

Lake Ontario Portland Cement Names G. H. Elliott President

The board of directors of Lake Ontario Portland Cement Company, Picton, Ont., announces the appointment of George H. Elliott as president and general manager, and as a director, of the company.

Mr. Elliott is also president of Rochester Portland Cement Corporation of Rochester, N. Y., a subsidiary of Lake Ontario Portland Cement Company. Prior to his new appointment, he was vice-president of the Gustin-Bacon Manufacturing Company of Kansas City, Mo., manufacturers of glass fiber insulation and related products.

Lehigh Scholarship Winners Feted at Company Gathering

Officials of the Lehigh Portland Cement Company, Allentown, Pa., recently entertained five students who are attending college under the company's scholarship program.

Lehigh's scholarship program was begun in 1952 with the establishment of the first corporation-endowed scholarship in the history of that institution. Now, more than $145,000 is allocated to the fund by the firm each year.

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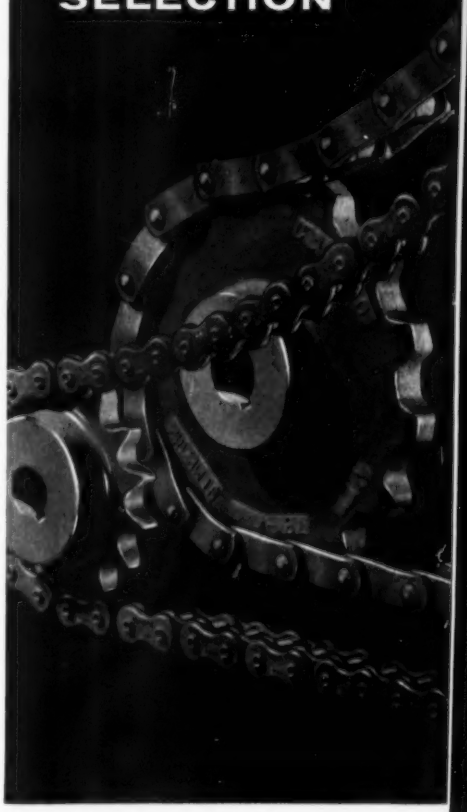

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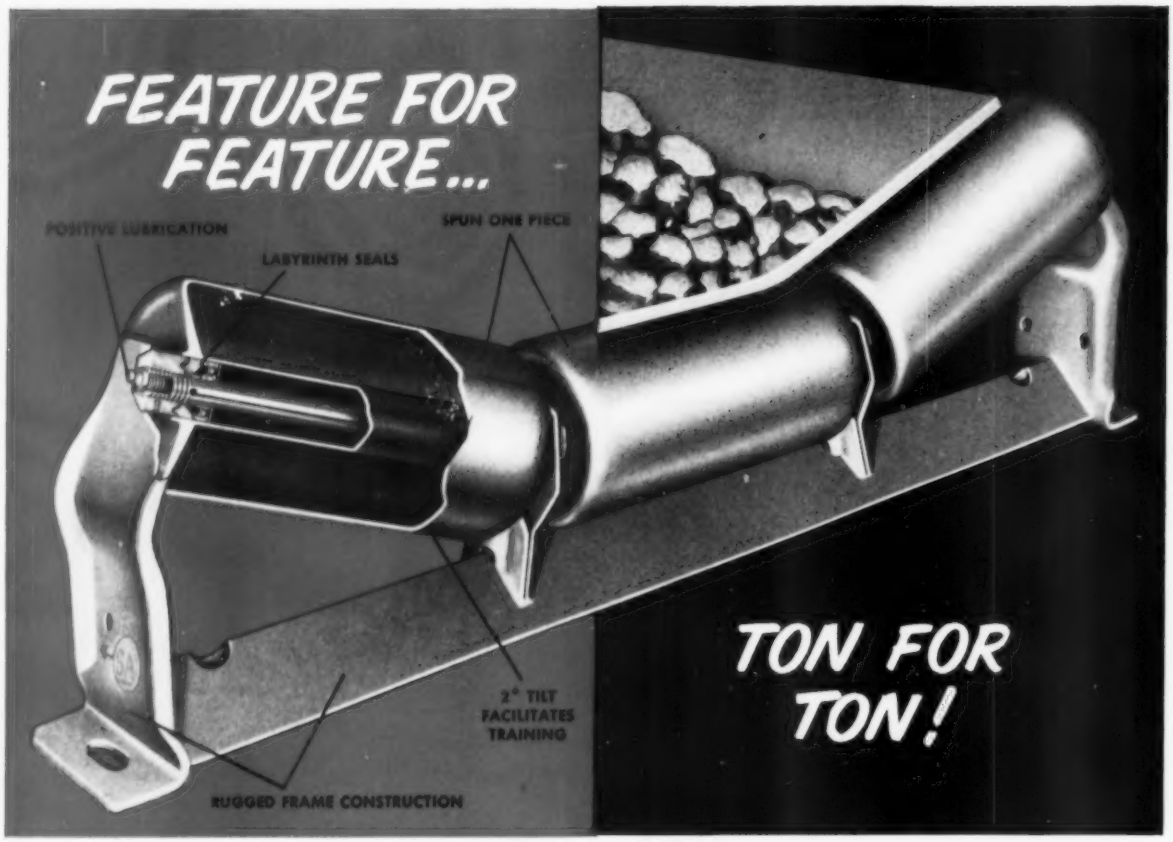

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WRITE FOR PULLEY BULLETIN 558

20° Ball Bearing Carriers—designed for years of service under rugged operating conditions.

Rubber Disc or Pneumatic "Impact" Carriers for use under loading spouts in belt or shuttle conveyors, or feeders to cushion the lumps.

"Curve Crown" Pulleys — S-A exclusive CURVE CROWN PULLEY design and SQUEEZELOCK HUB assure maximum belt training effect, gripping power for full torque transmission, minimum belt stretch and wear.

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PLANTS LOCATED IN: LOS ANGELES, CALIFORNIA • CLARKSDALE, MISSISSIPPI
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R. H. Wright & Son Co. Acquired by Houdaille As Florida Subsidiary

Ralph F. Peo, president of Houdaille Industries, Incorporated, has announced that contracts have been approved for the purchase of the physical assets and business of R. H. Wright and Son Company, a construction materials business in Fort Lauderdale, Fla.

The transaction was carried out on a cash basis, making the Wright firm a wholly-owned subsidiary of Houdaille. The business will be operated under the name of R. H. Wright, Incorporated.

Mr. Peo stated that, following its acquisition, Houdaille plans an extensive expansion of the new subsidiary's operations throughout Florida and the southeastern portion of the United States. All present R. H. Wright personnel will be retained, Mr. Peo said, although Robert L. Hummel, a Houdaille officer, will become executive vice-president and chief executive officer of the subsidiary.

American Cement Corporation Acquires 1500-Acre Tract

American Cement Corporation management has announced the purchase of more than 1,500 acres of land in Amador County, Calif. The acquisition consists of a large tract of limestone at Volcano, a clay deposit, and an alternate plant site near Ione. These tracts, according to D. S. MacBride, president of American Cement, are located approximately 35 miles southeast of Sacramento.

Riverside Cement Company, one of the divisions of American Cement, has plants in southern California serving that area and parts of Arizona and Nevada. Other American Cement plants are located in Michigan and Pennsylvania.

Jellick Appointed to Staff Of Portland Cement Bureau

The Portland Cement Information Bureau in San Francisco has announced the appointment of J. E. Jellick as consulting engineer for the bureau. A registered professional civil engineer, Mr. Jellick is an authority on concrete. He will continue as manager of the bureau office, a position which he has held for the last 12 years. Mr. Jellick's services will continue to be made available to architects, engineers, contractors, and public officials seeking information about concrete or requesting inspection of jobs on which concrete is being used.

The Portland Cement Information Bureau is supported by the Calaveras Cement Company, Pacific Cement and Aggregates, Inc., and the Permanente Cement Company.

Longhorn Portland Cement Donates $50,000 to Trinity U.

The Longhorn Portland Cement Company of San Antonio, Tex., has donated $50,000 to the long-range development program of Trinity University.

C. W. Miller, chairman of the university's board of trustees, announced that the gift will be employed to strengthen the science program. The purchase of equipment for physical chemistry, quantitative analysis, and general chemistry has been authorized by Trinity trustees.

I'm walking on air...

Just had my annual medical checkup. (Smart move.) I'm making out a check to the American Cancer Society, right now—that's a smart move, too.

Guard your family! Fight cancer with a checkup and a check!

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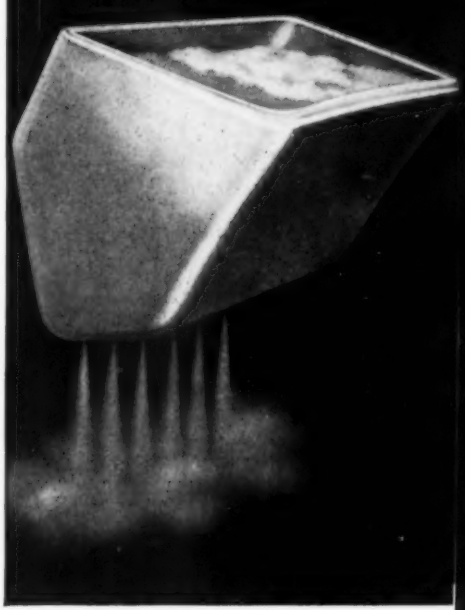

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Dragon Cement Orders Bag-Type Stack Collectors For First of Four Kilns

Dragon Cement Company, Northampton, Pa., has ordered a Dracco-Fuller stack dust-collecting system capable of filtering the smallest dust particles. If the system attains peak efficiency, the management plans to filter smoke as well as dust going through the stacks.

Installation of the system on the first kiln will be completed by May, and it is planned to install similar dust collectors on the remaining three kilns.

The 392-Fiberglas-bag setup will supplement the mechanical cyclone dust-collectors now being used, and will act as the kiln gas cleaner. Each bag is 11½ in. in diameter and 25 ft. long. The system will have seven cells, although only six are normally required. The new equipment is a part of Dragon's $600,000 air pollution control program.

A. P. Green Fire Brick Co. Acquires Climax Fire Brick

By an exchange of common stock, the A. P. Green Fire Brick Company has acquired the Climax Fire Brick Company, of Climax, Pa. Principal products of the Climax firm are Pennsylvania type fire-clay refractories, including Bessemer tuyeres, rider tile, open-hearth checkers, cupola blocks, and a small production of high- and medium-duty fire-clay brick. These products differ from those produced in the other Green plants, including the main plant at Mexico, Mo.

No changes will be made in the operating staff of Climax, and the present line of products will be continued.

Div. of Allied Chemical & Dye Building Automated Plant

Ground was broken recently for a new gypsum calcining plant in Edgewater, N. J., which will be operated by the Barrett Division of Allied Chemical and Dye Corporation. The plant is expected to handle up to 20,000 tons of gypsum ore in one load.

The docks for the plant reportedly will have the largest bulk-ship-unloading facilities in New York Harbor—up to 900 t.p.h.

A fully automated one-step operation, the new plant is geared to be operated on a 24-hour day basis, and will turn out 800,000 sq. ft. of gypsum wallboard per day.

Domestic Clay Production Decreases 8 Percent in 1958

Combined output of ball clay, bentonite, fire clay, fuller's earth, kaolin, and miscellaneous clay decreased 8 percent in quantity and value in 1958 from 1957, according to preliminary estimates made by the U. S. Bureau of Mines. Production of these clays totaled 42,291,000 short tons, valued at $42,968,000 in 1958, compared with 45,781,000 short tons, valued at $155,945,000 in 1957.

In 1958 the seven leading clay-producing states were California, Georgia, Missouri, North Carolina, Ohio, Pennsylvania, and Texas, the same as in 1957. All states except Georgia and Texas reported declines in 1958. No production estimates were received in 1958 from Alaska, Hawaii, Puerto Rico, and Rhode Island. In 1957, Hawaii and Puerto Rico had been listed as producers.

Riverside Cement's Anglers Fish in Firm's Private Lake

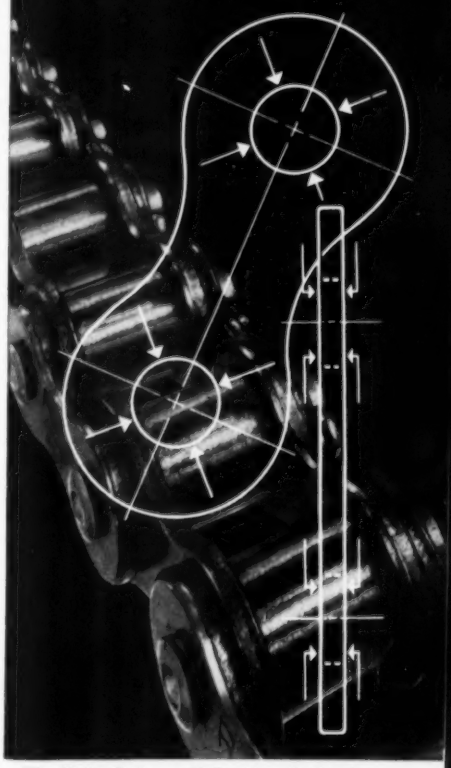
Sunday, February 1, 1959, marked the official opening day of fishing for employees of the Riverside Cement Company's "Wet Weather Lake Angling Club."

The lake, formed by the cement firm's abandoned Wet Weather Quarry near Riverside, Calif., has been stocked with thousands of fish —trout, bass, bluegill, and croppies. About 85 employees of the company are charter members of the angling club, paying $1 a month dues for the privilege of fishing in the private lake. All fishing is done from shore, no boats being allowed on the lake.

The fifth cement plant of Cementfabriek IJmuiden (CEMIJ) began operating in the latter half of 1958 at Hoogovens (Royal Netherlands Blast Furnaces and Steel Works, IJmuiden). This plant, which has a reported hourly capacity of 35 tons, is expected to increase cement production at IJmuiden to 600,000 metric tons annually.

Another PLUS value...

FIGHTS FATIGUE



To fight fatigue, link plate holes in Rex Roller Chains are accurately located in relation to each other...accurate in size throughout the thickness of the link...parallel...smooth and uniform. This accuracy assures exceptionally close control of chain pitch. Pitch control means extra resistance to fatigue...longest chain life. For the complete story on the *PLUS VALUES* in Rex Roller Chain, see your Rex Distributor or mail the coupon.

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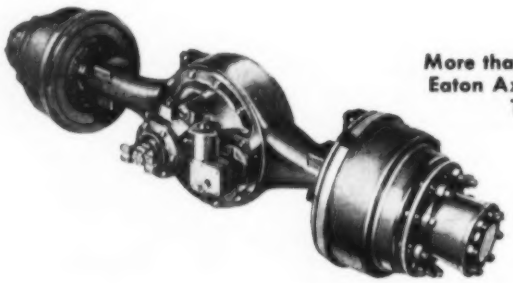
Eaton Inductalloy Axle Shafts, hardened by the Eaton induction hardening process which produces an extremely hard case that extends deep into the material structure, are able to handle more pounds of torque without fatigue failure. The result is extra thousands of trouble-free miles added to axle life, more vehicle time on the road—less in the shop, and reduced maintenance expense.

The superiority of Eaton Inductalloy Shafts is performance proven by millions of miles of heavy duty operation. Ask your dealer for complete information.

EATON INDUCTALLOY SHAFT

ORDINARY AXLE SHAFT



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Gardner-Denver Company Celebrating Centennial Of Service to U.S. Industry

Gardner-Denver Company, Quincy, Ill., is celebrating 100 years of service to the world's basic industries in 1959. It has grown with those industries by following its Centennial motto: "Equipment Today for the Challenge of Tomorrow."

Forerunner of the modern Gardner-Denver Company was the Gardner Governor Company — founded in a one-room machine shop in Quincy, Ill., on May 15, 1859. This company flourished by producing governors for steam engines when steam was the world's major source of power. When compressed air began to replace steam as a source of portable power, about 1900, Gardner Governor expanded its line to make air compressors. The quarrying industry started using air to power the drills that made blast holes.

A major producer of the new air drills was the Denver Rock Drill Manufacturing Company, founded in 1905. Gardner Governor and Denver Rock Drill were co-operating with the users of their products to develop new equipment. This co-operation led to the first quarry and road rigs developed by Denver Rock Drill about 40 years ago. Gardner Governor compressors often were mounted on rigs made in Denver for use in quarrying. The drills and compressors were also used together in other industries, and in 1927 the two firms merged, forming the Gardner-Denver Company.

G. V. Leece

The merged company, with its pooled resources and technical knowledge, has continued to serve basic industry. Among the most recent Gardner-Denver developments have been the Air-Trac and its big brother, the Deluxe Air-Trac. These machines maneuver over a quarry drilling blast holes, and have made nearly a pushbutton operation out of what was once a vastly more rugged job.

Gifford V. Leece, president of Gardner-Denver, expressed the belief that the forward-looking spirit of the firm's staff guarantees continued progress in research and new product development.

$50,000 Ice Bridge in Alberta Speeds Work for Producer

At Edmonton, Alberta,, a $50,000 artificial ice bridge has been completed across the North Saskatchewan River for operations of Twin Bridges Sand and Gravel Limited. A 75-hp. refrigeration plant of the type employed to make ice curling and hockey rinks was used to form the ice highway across the stream.

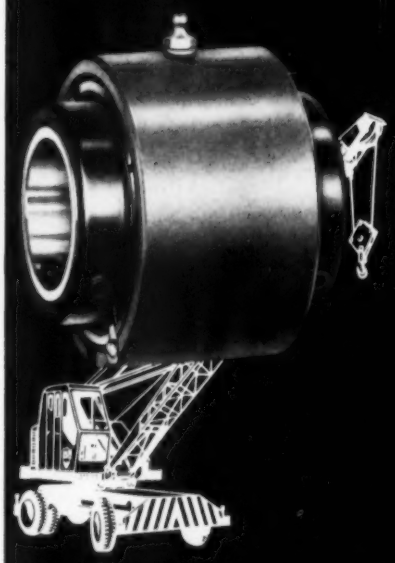
According to Lorne Clapson, general manager of the firm, the structure will bear the 25-ton payloads its trucks will carry until late in March.

It was decided to build the span to furnish a short-cut for trucks after the company had received a $293,00 contract to haul 200,000 tons of gravel into the city. Haulage cost will be from 6 to 10 cents per ton-mile. Officials expect the bridge to save 600,000 ton-miles and considerable time. The truck route via the ice bridge will save 3½ miles a haul.

Kaiser Gypsum Company's Seattle plant has received the President's Cup Safety Award, representing the top safety record among the firm's four plants. Operating around the clock, seven days a week, the Seattle plant marked its third consecutive year without a lost-time accident.

Another PLUS value...

BUILT TO TAKE IT... EASY



EASY roll of a ball

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Here's why Shafer Bearings add extra stamina and life to heavy-duty equipment. Combining the low rolling friction of a ball with the high load-carrying capacity of a roller, they roll easily, yet take more of the most punishing loads and shocks. Shafer Bearings take radial, thrust or combined loads and misalignment without binding, without loss of load capacity. See your distributor or write for latest catalog.

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Bring on those gruelling, earth-moving, profit-making jobs and just watch this mighty Dodge D800 dump truck clean them up.

It weighs in at 29,000 lbs. maximum G.V.W. It's big and tough. It's packed with power and the right equipment to get the job done in short order. Special transmission, if you need it—special axle, springs, brakes—whatever your kind of trucking requires.

Big-load hauling was never easier . . . never more profitable . . . than in new, improved '59 Dodge "Job-Rated" heavy-duty trucks with G.V.W.'s to 49,000 lbs., G.C.W.'s to 65,000 lbs.

Your Dodge dealer has full information. He'd like nothing better than to talk to you, and tell you why . . .

today,
it's real smart
to choose Dodge
Trucks

To provide maximum flexibility in loaded, off-road service and at unloaded highway speeds, a 4-speed auxiliary transmission is now offered for all conventional and tandem models in the Dodge 800 and 900 series. Another benefit for more truck buyers!

Industry Personalities

F. J. Schmitt Jr.

FRANK J. SCHMITT JR. has been appointed sales manager of the Ruberoid Company's Dallas, Tex., district. Mr. Schmitt, who has been assistant sales manager there, succeeds the late C. B. Lundin, who died on January 20.

Mr. Schmitt joined Ruberoid in 1929, and became office manager of the company's St. Louis plant in 1935. He was later named assistant to the general superintendent, then sales representative in Oklahoma, and finally assistant sales manager (1958).

The following appointments have been announced for the Columbia-Southern Chemical Corporation, Columbia Cement Division, Zanesville, Ohio:

J. R. PINNICK, formerly sales representative for the southern Ohio territory, was transferred to Columbus as contract sales representative.

ROBERT H. SMITH has ben named to succeed Mr. Pinnick as sales representative for the southern Ohio territory, with headquarters in Chillicothe.

RICHARD WALTER was assigned to the southwestern Ohio sales territory as sales representative. He will succeed C. D. McKinley, who has retired.

PAUL RUTHERFORD was appointed sales representative for the northeastern Ohio sales territory.

ROBERT L. BARKER, formerly general foreman at the Portland, Oreg., plant of Ideal Cement Company, has been promoted to assistant plant manager, Redwood City, Calif.

ROB ROY CERNEY has become assistant plant manager at Portland, having formerly served in the same capacity at Boettcher.

RALPH A. MAY, formerly general foreman at Boettcher, replaces Mr. Cerney as assistant plant manager.

VINCENT E. WESSELS has been promoted to vice-president, Great Western Aggregates, and THOMAS C. BROWN was named vice-president and general manager. (Great Western Aggregates is a wholly-owned subsidiary of Ideal Cement Company.)

Mr. Wessels joined Ideal in 1949 as plant manager of the firm's Mobile, Ala., plant. In 1952, he was transferred to Ideal's general offices in Denver as technical assistant to the general production manager. On July 15, 1957, he was promoted to the position of assistant to the president. His new responsibilities as vice-president of Great Western will be in addition to his duties as assistant to Ideal's president, Cris Dobbins.

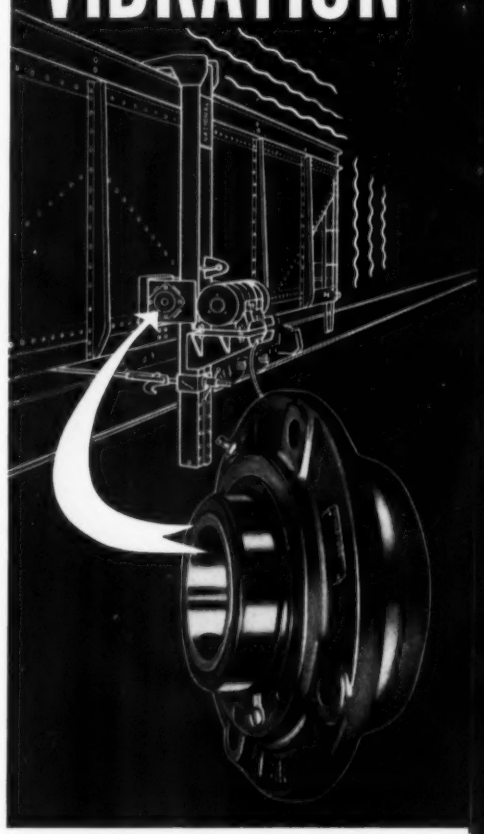
Mr. Brown, who joined Ideal in 1948 in the sales department, was placed in charge of Great Western Aggregates, field experiments in 1952. Subsequently, he moved to Ideal's research center at Fort Collins. In 1955, he became manager at Laramie, Wyo., and in 1958, sales manager in Denver.

THOMAS F. MURRAY JR. has assumed duties as manager of the Vestal, N. Y., plant of Central Asphalt, Incorporated. The new manager has been named a vice-president and director of the company. For the last 12 years he has been employed by the American Bituminous and Asphalt Company.

R. H. B. SMITH, vice-president of Dragon Cement Company, New York, has accepted appointment as chairman of the general construction division of the 53rd annual appeal of the Travelers Aid Society of New York.

Another PLUS value...

BUILT TO TAKE
VIBRATION



Even under car-shaker vibration that loosens tons of coal, Shafer Bearings keep their steel grip on longer life.

This reserve stamina stems from exclusive bearing design and precision construction. Concave rollers matched to convex raceways are of highly elastic, case-hardened alloy steel. With every shock, rollers compress, increasing bearing surfaces.

Even under misalignment, Shafer Bearings roll safely with the punch. See your distributor or mail coupon.

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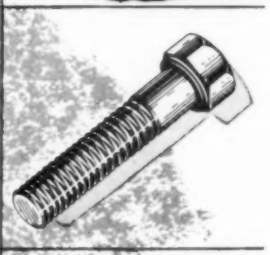
HIGH TENSILE CAP SCREWS

The Cap Screw for your TOUGHEST job! 1038 Steel, double heat-treated for extreme hardness and highest breaking strength. Use them ONCE and you'll specify Black Diamond always.



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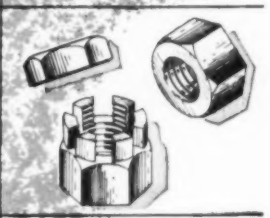

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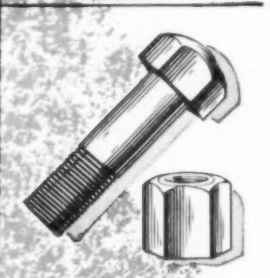
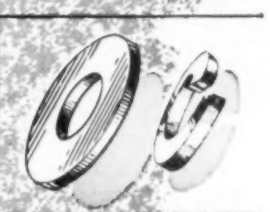
TRACK SHOE BOLTS & NUTS

Made on the world's most modern automatic bolt-making machines, by experienced Craftsmen! Selected steels which, when heat-treated develop physical properties guaranteed to equal or exceed properties specified by any original equipment manufacturer.



SPRING LOCK WASHERS, STANDARD WROUGHT WASHERS

In stock up to 2" bolt sizes; precision made. ANY size can be made special-to-order on short notice.



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ALL STOCK ORDERS FILLED AND SHIPPED WITHIN 48 HOURS . . . TO ANYWHERE IN THE WORLD!

G. A. Gauthier

GERARD A. GAUTHIER has been named to head the Peerless Cement Company's newly established business research department.

Mr. Gauthier, as director of business research, will concentrate on company planning, business and market forecasting, budgeting, and other special management studies. He has been with Peerless for 10 years and has served in engineering and administrative posts.

The appointment of COLON BROWN of National Gypsum Company, Buffalo, to the newly-created position of assistant to the president, was recently announced.

Mr. Brown, who began his career with National Gypsum in 1937, occupied successively the posts of manager of the Mobile plant, general manager of the ordnance plant which National operates for the government at Parsons, Kans., director of subsidiaries, and general manager of the company's West Coast paint business.

H. C. BLUE has been named president of the Kansas City Quarries and Concrete Companies by the firm's board of directors, succeeding the late Mrs. Gertrude Spencer. He has been associated with the Kansas City concern for 23 years.

A. T. LUXFORD, who has served the firm for 12 years, has become vice-president in charge of operations for the company. His new position will involve supervision of concrete sales and deliveries.

United States Gypsum Company has announced the appointment of THOMAS F. MACLENNAN of Berwyn as quality field manager. Mr. MacLennan joined Canadian Gypsum Company in 1957 as assistant quality supervisor at Hagersville, Ont.

E. E. SCHOLER, Shell Asphalt manager, St. Louis division, has been elected vice-president of the Asphalt Institute and vice-chairman of Division III of the Institute.

FRANK B. MARCON has been promoted to plant manager of the Catskill, N. Y., plant of the Alpha Portland Cement Company, Easton, Pa., according to an announcement by Ernest F. Brownstead, vice-president, operations. Mr. Marcon joined Alpha in 1954 as plant engineer at the Catskill plant. A year later he was transferred to the Martins Creek, Pa., plant. In 1956, he returned to Catskill as assistant superintendent, remaining in that position until his recent promotion.

A. P. STONE, formerly southern sales manager of the Lehigh Portland Cement Company, Allentown, Pa., was recently appointed sales manager of the firm.

W. D. GARVIN, formerly district sales manager at Birmingham, Alabama, will succeed Mr. Stone as southern sales manager. G. B. FAWLEY, who was previously district sales manager, will succeed Mr. Garvin.

F. ROBERT CAMPBELL, manager of packaging for National Gypsum Company, has been elected chairman of the Packaging Institute's bag committee.

Mr. Campbell joined National Gypsum Company in 1953 after 17 years of experience in the packaging field. He is in charge of the building materials firm's product packaging program.

THOMAS L. MYER is the new sales representative in charge of Southern Lightweight Aggregate Corporation's office for the Washington, D. C. area. This announcement was made by A. Cabell Ford, director of sales for the parent company in Richmond, Va. Southern Lightweight Aggregate Corporation produces Solite, the lightweight aggregate used in the manufacture of Solite lightweight structural concrete and masonry units.

The appointment of EDWARD A. ATWOOD JR. as director of advertising and public relations for Vulcan Materials Company, Birmingham, Ala., has been announced by C. A. Barinowski, vice-president of sales.

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GREATEST SELECTION...

APPLICATION RATED

You quickly find the one best idler for your specific service requirements when you specify Rex. For two reasons: 1) Rex offers you the industry's most complete line; 2) each Rex Idler is accurately rated for specific applications in each of four basic service groups—moderate, standard, heavy, and super-service lines. This assures easy selection, longest life, minimum maintenance and lowest possible unit cost in your installation. See your Rex Distributor or mail the coupon today.

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SIZE TESTS CRUSHED STONE, GRAVEL, SAND, ALL ROAD AGGREGATES

Makes 2 to 7 separations simultaneously in five minutes or less. Size range: 4-in. to 200-mesh. Sand attachment optional for handling 8-in. sieves.

Write for the GILSON catalog

Fill out coupon or clip it to your letterhead.

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Enter 52-A on card, page 139

FOR DEPENDABILITY PLUS ECONOMY REPLACE WITH

INDIAN BRAND

Get the most out of your present equipment. When you need replacements, remember we started in 1913 to build our reputation in the Manganese Steel field for dependability plus economy.

Insist on INDIAN BRAND MANGANESE STEEL

Shovel Dippers • Dipper Teeth
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Mantles • Concaves
Bowl Liners • Roll Shells
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Grate Bars • Breaker Plates
Ball Mill Liners • Screen Plates
Misc. Manganese Steel Castings

THE FROG, SWITCH AND MANUFACTURING COMPANY
Carlisle, Pennsylvania • Established 1881

Enter 52-B on card, page 139

ROBERT F. MACKRELL, nationally-known transportation authority, retired recently as director of transportation for the National Gypsum Company. He joined National Gypsum in 1926 and set up the company's one-man transportation department. He plans to establish a service as a transportation consultant in Buffalo, N. Y.

WILLIAM T. DAVIDSON will succeed Mr. Mackrell in the post of director of transportation. Mr. Davidson has been general traffic manager for the company since 1949.

RALPH V. ANDERSON, general supervisor, costs and statistics dept. of the Universal Atlas Cement Company, has been appointed assistant to the comptroller. CHARLES C. PURDY, supervisor, financial analysis, will succeed Mr. Anderson as general supervisor.

Two Canadians have been named to executive positions at the General Refractories Company of Canada, Ltd., Smithville, Ont.

RALPH A. SHONK has been promoted to vice-president and general manager of the company, and FRED A. MOORECROFT becomes assistant secretary and assistant treasurer.

CHARLES FOSTER BROWN, DR. ADAM S. BORST, and HERBERT G. BRAASCH have been named to the board of Sayre & Fisher, Sayreville, N. J. The 108-year-old brick concern recently entered the field of synthetic lightweight concrete aggregate with its product, Aglite.

JOHN D. WILSON, former executive vice-president of Giant Portland Cement Company, Philadelphia, Pa., has been elected president of the firm. Ronald M. Craigmyle, former president, will continue as chairman of the board. Mr. Wilson previously held the office of executive vice-president.

New York Trap Rock Corporation has announced the resignation of GERALD M. BOYLE, a director of the corporation, as well as vice-president of sales and transportation.

Carl L. Morris has joined the staff of the Marquette Cement Manufacturing Company in Chicago as assistant director of engineering. He was formerly associated with Basic Chemical Corporation and Climax Molybdenum Company, the latter a division of American Metal Climax.

Obituaries

FRANK L. PAIGE, 78, who retired as treasurer of the Portland Cement Association in 1947 after 30 years service, died recently at his home in Chicago.

JAMES B. JOHNSON, 75, retired secretary of the General Portland Cement Company, Chicago, died recently. Mr. Johnson retired in April, 1958, after 34 years with the firm.

LEO P. KUNKEL, sales manager in the Chicago office of the Chicago Gravel Company, died unexpectedly on January 21. He had been associated with the firm for almost 25 years.

EVERETT G. ROGERS, 75, former purchasing agent for the International Talc Company, Governeur, N. Y., died recently. He became purchasing agent for the firm in 1943 and retired in 1954.

BRUNO M. GRENCI SR., founder of Grenci and Ellis, Incorporated, a granite firm, died January 2 at his home in Frankfort, Maine.

KENNETH T. PRICE, vice-president in charge of Louisiana production operations of Freeport Sulphur Company, New York, N. Y., died unexpectedly of a heart attack at the age of 55.

ARNOLD P. WEIBLE, vice-president and general manager of Fraser Cement Products Company, died on Christmas Day at his home in South Pasadena.

B.F.Goodrich

Why contractor calls B.F.Goodrich tires "the best tires for the job!"

KILLIAN-HOUSE CO. constructs roads and bridges within a 100-mile radius of San Antonio, Texas. 143 pieces of rubber-tired equipment are at work, including 30 flat bed trucks, 10 scrapers, 24 dump trucks, 30 pick-ups, 12 road rollers and 12 water trucks. The company uses B.F.Goodrich tires on this fleet because, says Partner Jack House, "They are the best tires for the job."

For example: Traction Express tires average 75,000 miles of service where previous makes gave considerably less; Tractor Grader tires are being retreaded as many as 4 times; on the new Rock Service Tubeless tires above, the company estimates retreads will save them 30% over other makes.

The new B.F.Goodrich Rock Service tire has an enormous, double-chevron tread that defies rock cuts and bruises, grips the ground for full traction in forward or reverse. Under the tread is the B.F.Goodrich FLEX-RITE NYLON cord body that withstands double the impact of ordinary cord materials, resists heat blowouts and flex breaks. This is why the FLEX-RITE NYLON body outwears even the extra-thick Rock Service tread, can be retreaded over and over.

See your B.F.Goodrich Smileage dealer today and find out how you can save on tires for all types of off-the-road jobs. He's listed under Tires in the Yellow Pages of your phone book. *B.F.Goodrich Tire Co., A Division of The B.F.Goodrich Co., Akron 18, Ohio*

Enter the B.F.Goodrich Truck Tire Mileage Contest. You can win a Thunderbird or Corvette or one of 310 other prizes. See your B.F.Goodrich dealer for entry blanks.

Smileage!

Specify B.F.Goodrich Tubeless or tube-type tires when ordering new equipment

B.F.Goodrich *truck tires*

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Chevy power is tough—

and proves it on bruising off-the-road hauls!

That Series 100 Chevy tandem above takes a terrific pounding as it hauls huge loads of gravel or fill dirt into the heart of California's redwood country. It goes miles off the road, makes up to 24 trips a day through rocky forest land. Yet owner Bernard Conti, of the Conti Sand & Gravel Company, reports only one hour of downtime in 20,000 miles on this truck-killing road construction job. And Chevy's tough power gets the truck through faster, Mr. Conti says; assures more trips—more profits—per day!

Hauling outsized loads of fill dirt through California's forests calls for a heavy-duty truck that's rock-rugged and powerful as they come; one that's soundly built down to the last bolt. And the Conti Sand & Gravel Company bears witness to the fact that Chevrolet is just such a truck. They're completely satisfied with their Series 100 model, from the dependable pulling power of the big 230-h.p. Workmaster V8 to the work-whipping qualities of the tough-built chassis components. And you'll be equally satisfied with whichever Chevy heavyweight or middleweight *your* work requires!

Mr. Conti indicates that Chevrolet's Powermatic* transmission is of special importance in this rugged service. It helps him to bull through the tough spots with exceptional ease. This fully automatic 6-speed transmission virtually eliminates manual gearshifting! It also provides a Hydraulic Retarder that helps you control truck speed and saves wear on the service brakes.

**Optional at extra cost, Series 50, 60, 70, 80, 90 and 100 models.*

No job's too tough for a

Chevy's powered to cut costs and keep going on your tough off-the-road hauls!

That's for *sure*, whether you use mighty middleweights or high-capacity heavyweights—whether you prefer V8's or 6's.

Take Chevrolet's 1959 big-truck V8's, for example. As indicated by that tough truck job pictured above, these modern engines are out to whip any work that comes their way. They've got what it takes to do it. The *shortest piston stroke* of any comparable truck V8's: a sure sign of more work on less fuel. Compact design that cuts down on truck weight and helps assure the biggest possible payloads. Scores of up-to-the-minute features that know how to trim overhead: full-flow oil filter, hydraulic valve lifters, hard-faced exhaust valves and hardened valve seats, extreme-duty Moraine 400 bearings, rotor-controlled governor, overspeed warning light and many more.

And with a *complete* lineup of modern V8 powerplants—including 160-h.p. Trademaster, 160-h.p. HD Taskmaster, 175-h.p. HD Super Taskmaster, 185-h.p. Workmaster Special and 230-h.p. Workmaster—Chevy can match the engine to your work, ideally.

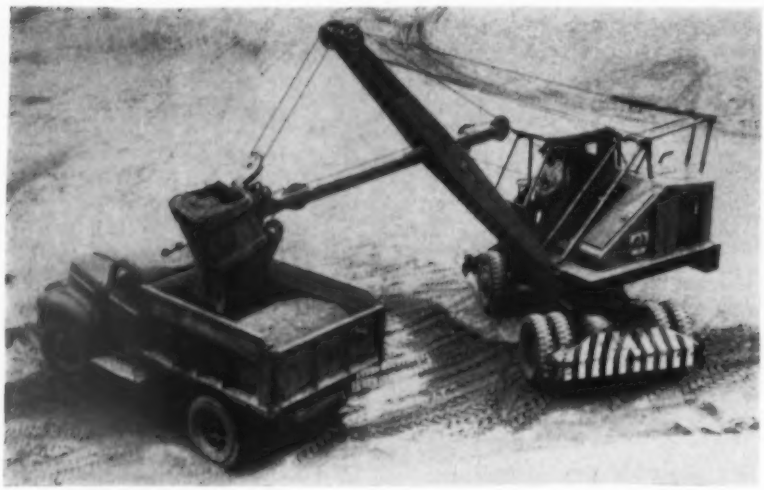
Or if you prefer 6's, Chevy's *still* your best bet. Standard in Series 40 models is the 135-h.p. Thriftmaster 6, better than ever for '59 with a new Economy-Contoured camshaft that improves gas economy by 10%! And in Series 60 there's a new edition of the 150-h.p. Jobmaster 6. It offers new durability stemming from new tougher built pistons and Stellite-faced exhaust valves. Both of these famous 6's provide plenty of hard-pulling torque.

Six or V8, you'll go a long way before you see the likes of this '59 Chevy engine lineup. Actually, there's only one *best place* to go for all your trucking needs—and that's to your Chevrolet dealer's. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

Chevrolet truck!

CHEVROLET

Enter 54 on card, page 139

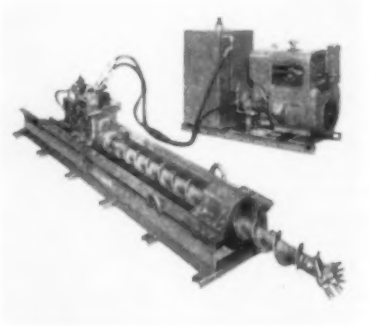


● Schield Bantam Company introduces its completely redesigned line of ⅜-cu. yd. crane-excavators, featuring increased lifting capacities of 11 tons on the Model T-350 carrier-mounted Bantam, 11 tons on the self-propelled CR-350, and up to 8 tons on the crawler-mounted C-350.

The "350" basic unit has been redesigned to give greater strength, less wear, and longer, trouble-free life. Improvements include a new turntable which features a combination hook and trunnion roller design offering fewer parts, better load distribution, less wear, and maximum strength for the greatly increased capacities. Continental F-209 gasoline engines add approximately 14 percent more horsepower to the new models.

New attachments available for the Bantam include ⅜- and ½-cu. yd. dragline buckets, ½- and ⅝-cu. yd. rehandling buckets, and a heavy-duty rock bucket. A new deep section crane boom is offered with boom lengths to 70 ft., with both 5- and 10-ft. boom inserts available.

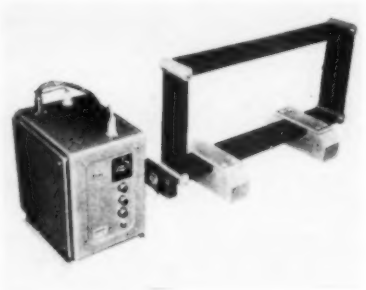
Illustrated is the self-propelled Model CR-350, shown loading sand with a rehandling bucket. The unit doubles as a high speed excavator and heavy-duty crane. Features include one-man, one-engine operation, 4 x 2 or 4 x 4 drive, automotive-type steering, and no-shift, forward-reverse travel. Also new on the CR-350 are by-passing, box-beam outriggers for maximum lifts to 11 tons. Top travel speed in high range is 10.98 m.p.h. **(351)**



● A new line of exploratory drills which handle augers from 4 in. to 24 in. in diameter and 2 ft. to 6 ft. in length has been introduced by The Salem Tool Company. All drills have variable hydraulic feed installed in a rigid frame for drilling accuracy.

Model 10-D, the smallest unit, has a separate gasoline power supply unit which is connected to the drill by two 25-ft. hoses with quick-disconnect couplings. The power unit can be operated from the ground or left on the truck. The Salem 10-D can also be operated from any other source capable of furnishing hydraulic power of proper quantity and pressure. It will handle augers up to 10 in. in diameter.

Models 16-TD and 24-TD will handle augers up to 16 and 24 in. in diameter respectively. Power units on these drills are an integral part of the machine and are gasoline operated. Both units have four-speed transmissions and start electrically. A larger model will handle augers of 36-in. diameter. **(352)**



● A new heavy-duty electronic metal detector for rock crushing operations has been added to the line of metal detection equipment manufactured by the Radio Corporation of America. The improved unit is ruggedly built, and features copper bar construction in the inspection aperture.

This metal detector can be set to detect all types of metals, both magnetic and non-magnetic. It mounts around a conveyor belt and when tramp metal is present, automatically sounds an alarm before the metal can reach the crusher. The unit can also be set to stop the conveyor belt, light a lamp, or spray-mark the area in which metal is present. **(353)**

and equipment

for further information use card on page 139

● Now available on Fuller Manufacturing Company's 10-speed RoadRanger transmissions is a new air-actuated gear shifting control unit. Called the Fullair control, the unit consists of a small master control which replaces the conventional gear shift lever or corresponding part of a mechanically actuated remote control. Movement of the short shift lever of the master control through the normal shift pattern identified on a slotted template actuates air valves, which in turn release compressed air to a slave unit on the transmission to activate power cylinders in such a manner as to select and engage the particular gear combination required.

A light on the instrument panel identifies the neutral and in-gear positions of the transmission. The light is on when the transmission is in neutral, and off in the geared positions. If the light remains on after the shift, gear engagement has not been secured and the driver is warned to declutch and repeat the shift.

The standard range selector handle is mounted near the Fullair control. The selector handle is used with a Fullair control in identically the same manner as with 10-speed RoadRangers equipped with the standard gear shift lever, and provides quick, easy engagement of all ten forward and two reverse speeds. **(354)**

● Ford Motor Company has added three models of backhoes in 10-, 12-, and 14-ft. sizes to its line of tractor-mounted tools. Reach of the 10-ft. backhoe is over 17 ft.; the 12-ft. model has a reach of 19 ft.; and the 14-ft. unit, a reach of over 20 ft. The 10-, 12-, and 14-ft. backhoes are available with three standard bucket sizes of 12, 18, and 24 in., which have corresponding bucket capacities of 2½, 4½, and 6 cu. ft. An extra capacity bucket of 7 cu. ft. is also available.

These backhoes can undercut and dig under and well forward of the tractor's rear wheels, and they can dig on slopes and dump full bucket loads of spoil on the uphill side. They have full power throughout their 185-deg. swing.

The 10- and 12-ft. backhoes can be used on Ford NAA, 600, 601, 800, and 801 tractors. The 12- and 14-ft. backhoe can be used on the Ford 1801 industrial tractor and the Fordson Major and Power Major diesel tractors.

New on the Ford industrial tractors introduced late last year is the Select-O-Speed transmission, which can be shifted while the tractor is in motion without the use of a clutch pedal and which has 10 forward and 2 reverse speeds. Shifting from one gear to another is accomplished simply by dialing the desired gear ratio with a small hand-controlled lever just below the steering wheel. **(355)**

● This new 1¾-cu. yd. Moto-Loader, manufactured by The Thew Shovel Company, is shown in operation at the Kibblehouse Quarries, Perkiomenville, Pa., loading crushed stone.

An important feature of the Moto-Loader which permits high-speed loading operations is one-foot direction and speed control, leaving the operator's hands free to steer and control the bucket. **(356)**

● An addition to the current 600 c.f.m. portable rotary compressor class has been announced by the Worthington Corporation. The new unit is equipped with Cummins engine Model NH-220-Bl.

The new unit features "over-under" design, which puts the first stage compressor cylinder directly over the second stage. It has self-draining cylinders, a silent chain drive, and two filters. (357)

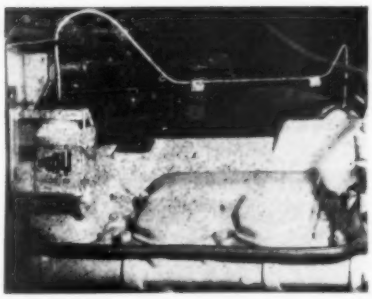
● A new tractor shovel, built specifically for the Fordson Major tractor, has been introduced by the Henry Manufacturing Company, Inc. Designated the Henry 900 tractor shovel, the unit includes as standard equipment a self-leveling bucket and bucket position indicator.

Two bucket sizes are available for the Henry 900—a 60-in. bucket with a capacity of ¾ cu. yd. heaped or ⅝ cu. yd. struck; and a 66-in. bucket with a capacity of ⅞ cu. yd. heaped or ¾ cu. yd. struck. The bucket has a maximum tilt back of 25 deg.; its maximum dump angle is 50 deg. With the bucket at a 40-deg. dump angle at 9 ft., the Henry 900 has a reach of 33 in.

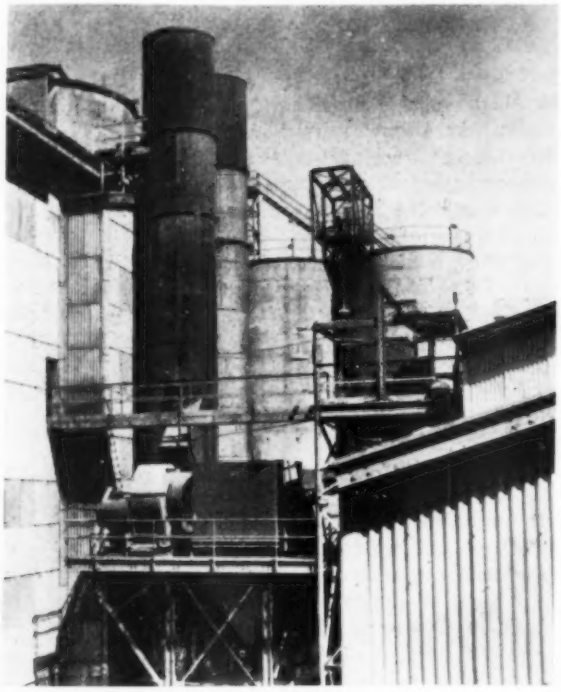
Through the strength of solid steel lift arms, the Henry 900 has a breakaway capacity of 5,000 lb. and a lifting capacity of 3,000 lb. to a full height of 9 ft. (358)

● Spray Products Corporation has developed the Instnstart applicator for its starting fluid for diesel and gasoline engines. Developed to use a standard can of pressurized Spray Starting Fluid, the Instnstart applicator administers the finely atomized starting fluid into the intake manifold through a closed system. There is no wasting of fluid, no contamination of the air with odorous, flammable vapors. Since there is no need to remove or bypass the air cleaner, no dust gets into the engine cylinder with the starting fluid.

In using the Instnstart applicator, the operator pulls the knob, admitting as much starting fluid as the engine needs to get started and run



smoothly on all cylinders. When the engine tends to race, the operator releases the knob and the flow of starting fluid stops instantly. When the engine shows signs of stalling, the operator pulls the knob and the flow of starting fluid resumes. (359)



● Installed on clinker coolers at the Dragon Cement Company, Northampton, Pa., two 173-tube Aerostatic dust collectors, manufactured by Hagan Chemicals & Controls, Inc., are trapping nearly 5 tons of powder-like cement dust every 24 hours. This dust, once a serious air pollution problem, is being returned to the process as a valuable re-usable product at an average rate of 9,500 lb. per day.

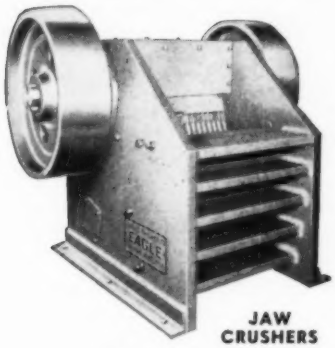
Results of efficiency tests conducted on one of the collectors a few months after installation showed that the collector was operating at an efficiency of 96.5 percent.

The high efficiency and long life of this collector are attributed to the design of the venturispiral vaned nozzles at the inlet of each separating tube. This design effects an almost instantaneous 6 to 1 increase in gas velocity, greatly intensifying the tangential or outward thrust characteristics of the centrifugal action. Even the most minute particles are ejected and collected, while larger particles are collected with a minimum of tube erosion. (360)

PRODUCE MORE STONE AND GRAVEL WITH MOBILE

Eagle Crushers

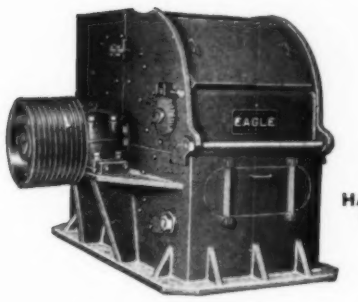
Eagle's new 6600 series portable jaw crusher—featuring low loading hopper—within easy reach of all makes of front end loaders. Variations in basic portable design provide for cage mills, hammermills and roll crushers.



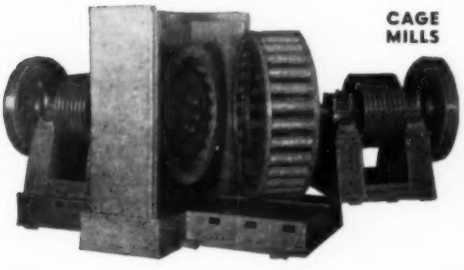
JAW CRUSHERS

Eagle Crushers bear the characteristic marks of the experienced manufacturer—simple design, durable construction, ease of servicing. Eagle originated the one-piece, electrically welded frame—has pioneered in the field of portable, compact, crusher plants like the one above.

The range of models and sizes in the Eagle line meet most every need from primary crushing to super-fines. Expert engineering counsel available to help you with technical problems. Write—describing your needs. Representative will call if you desire.



HAMMER-MILLS

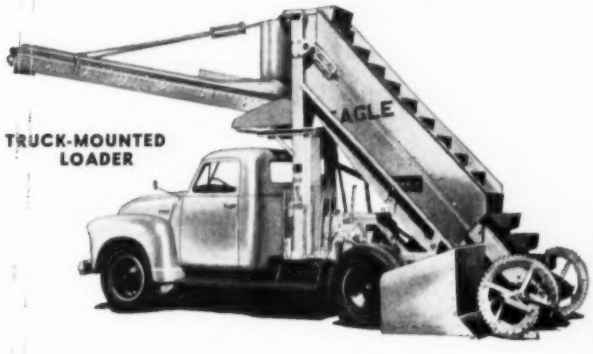


CAGE MILLS

EAGLE

JAW AND ROLL CRUSHERS, PORTABLE PLANTS, CAGE AND HAMMERMILLS, CONVEYORS, LOADERS

CRUSHER CO., Inc. GALION OHIO-U-S-A



TRUCK-MOUNTED LOADER

ONLY RINGBLASTER KILN GUN

assures greater smashing power backed by extra safety features

Break kiln rings faster, with fewer shots and less kiln down-time! Extra-powerful Western Super-X ammunition, fired from a Ringblaster heavy-duty kiln gun, cuts "keyways" better. Super-X offers outstanding accuracy, proved through ballistics tests and extensive on-the-job use.

Only Ringblaster has so much extra safety built-in, along with exceptional power, ease of operation, efficiency and exclusive sound-reducer to deaden firing noise.

Ringblaster is available to rotary-kiln operators on a lease basis. Write for further information on how Ringblaster and Super-X team to make kiln operations more profitable than ever before.

In addition to Ringblaster, the versatile Ramset System includes Ramset powder-actuated and Shure-Set hammer-in tools and fasteners.

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KILN RINGBLASTER GUN

Ramset Fastening System

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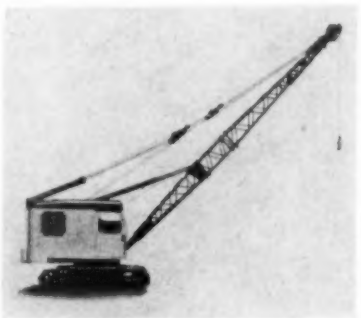
12175-C BEREA ROAD • CLEVELAND, OHIO

Enter 60 on card, page 139

• Yaun Manufacturing Company, Inc., has added to its product line a new orange peel riprap bucket in sizes from ½ to 2 cu. yd. The riprap bucket is designed to pick up piles of stone easily, and is especially adapted to unloading of gondola cars. Approximate weight of the ½-cu. yd. bucket is 2,000 lb.; of the 2-cu. yd. bucket, 12,000 lb.

Other products built by Yaun include clamshell, concrete, and dragline buckets, available in sizes from ¼ cu. yd. to 40 cu. yd. **(361)**

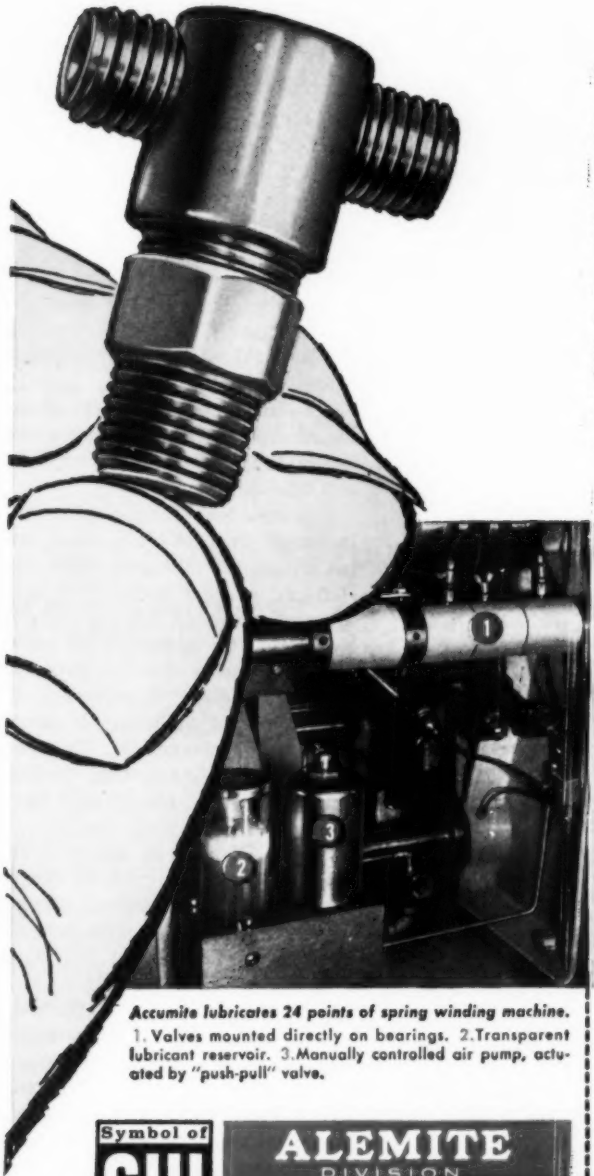


• Improvements in Northwest Engineering's ¾-cu. yd. models include a new independent worm boom hoist; true power load lowering; longer, wider crawlers; larger drums with greater cable capacity; larger drum brakes and clutches; larger uniform pressure swing clutches; an improved Feather-Touch clutch control for easier operation; and grouped lubrication.

This Northwest is to be known as the 25-D, and will be available as a ¾-cu. yd. shovel, standard crane, dragline, and pullshovel. It will also be furnished with additional features such as an 18-ton lifting crane. **(362)**

ACCUMITE® BY ALEMITE

...TO GIVE ANY MACHINE ALL THE ADVANTAGES OF CENTRALIZED LUBRICATION... AT LOW COST!



Accumite lubricates 24 points of spring winding machine. 1. Valves mounted directly on bearings. 2. Transparent lubricant reservoir. 3. Manually controlled air pump, actuated by "push-pull" valve.

Engineered for limited space, outperforms many higher-priced systems!

Alemite—with more than 40 years of centralized lubrication experience—announces an all-new compact system complete with pump, metering valves and controls—especially designed to service many machines and vehicles where centralized lubrication has been impractical until now!

Alemite's new compact Accumite system is especially adaptable to light, precision, multiple-bearing machines that have limited installation space. Its small size and simple installation overcomes cost limitations in most plants. Typical applications are: packaging, canning, labeling and textile machines... and machine tools. It is also suitable for tractor trailers, lift trucks and farm implements.

ACCURATELY METERS THESE SHOTS OF OIL OR GREASE

.003 cu. in. .006 cu. in. .009 cu. in.

ALL THE ADVANTAGES OF "BUILT-IN" MEASURED LUBRICATION—PLUS COMPACT SIZE!

- Meters exact amounts of refinery-clean lubricants to all bearings whenever system is operated.
- Eliminates shutdown time for lubrication.
- Seals lubricant against dirt, grit and water.
- Prevents bearing troubles due to neglect or use of wrong lubricants.
- Services all bearings in one operation.
- Avoids work spoilage and bearing repairs due to over-lubrication.

Mail coupon for full information!

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Please send me all the facts about your new "Miniature" Accumite system.

Name_____

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ALEMITE DIVISION
STEWART-WARNER CORPORATION
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FLEXCO®

CONVEYOR BELT SPLICE!

MORE THAN 3 TIMES THE STRESS PLACED ON MOST OPERATIONAL BELTS!

Tests such as this, using belts of various sizes and construction, are part of Flexible's continual effort to improve fastener design and performance.

FLEXCO—THE PREFERRED FASTENER BY BELT MAINTENANCE CREWS! Holding power . . . ease of application . . . wearability—thoroughly tested before they ever reach the user.

QUALITY FEATURES OF THE FLEXCO DESIGN . . .

Plates have special cupped ends on top and bottom . . . distribute the strain over entire plate area.

Teeth are spaced for best holding action.

Precision-made bolts and nuts.

FOR SPLICING, and REPAIRING RIPS and TEARS . . . ON NEW and WORN BELTS!

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"FOR THE SPLICE OF A LIFETIME"

Flexible STEEL LACING COMPANY

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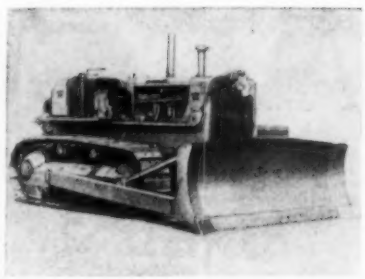

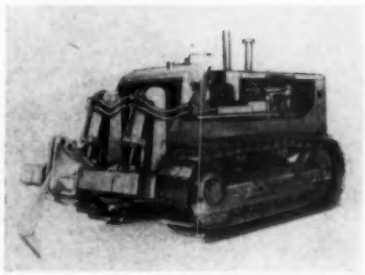

● A new line of matched tools has been made available for the Caterpillar Series H D8 direct drive and torque converter tractors. The line consists of three models of bulldozer blades—straight, angling, and U-dozer—and a No. 8 ripper, all designed for increased production, longer life, and ease of servicing and transporting.

The new No. 8S bulldozer is 9½ in. longer than its predecessor, and has a modified U-shaped blade. Angled end sections reduce end spillage and on sidehill cuts cut and cast material to the center of the blade.

Improvements on the No. 8A bulldozer include a two-piece C-frame, which can be easily assembled or dis-assembled. The new blade is 18 in. longer than the previous model, and has stronger basic construction and blade braces.

Gussets have been added to the No. 8U dozer to support the cutting edge base for maximum strength in this critical area. The No. 8U features an increase of 18 in. in length and 6⅜ in. in height.

The No. 8 ripper has been designed with the ability to match closely ripping angles to varying materials through the use of a redesigned five-position clevis. This feature provides the correct penetration and ripping angles.

Three new hydraulic controls have been introduced to operate the new D8 tools. They offer increased size and capacity and flexibility of arrangements. (363)

Enter 63 on card, page 139 →

Wearpact steel teeth on this bucket last over 8 times longer!

Maybe you don't dig anything as tough as slag—but the experience of The Holmes Construction Company, Wooster, Ohio, can still point the way to savings on *any* dipper tooth application.

They were using so-called wear-resisting teeth on a backhoe bucket... teeth that needed replacement in 1 to 3 days. As a trial, they installed one Wearpact Steel tooth on the bucket... *and it outlasted competitive teeth over 8 to 1!*

An average of over 1 months' service instead of 1 to 3 days... does this suggest a way for you to save money?

Now is the time to find out about longer-wearing, dollar-saving Wearpact... the new high-hardness steel—about 500 Brinell—that's ductile and tough. Write today for complete information!

Cut your costs with WEARPACT®

CAST ALLOY STEEL

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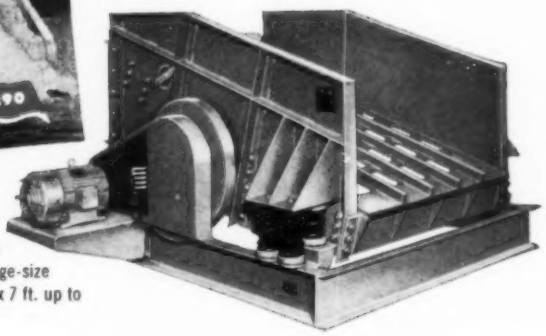
3800 Canal St., Indiana Harbor, Indiana

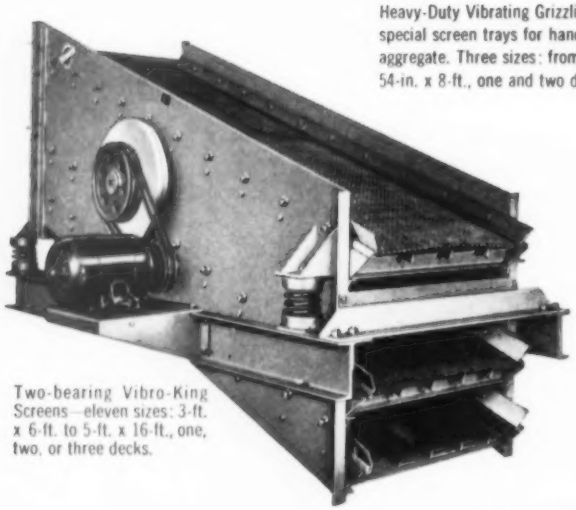
HOW TO PICK SCREENS *that pay profits*

Screening aggregates is a tough job—but it can be done efficiently and at low cost—with Telsmith Vibrating Screens. This new Telsmith bulletin tells you how. It explains which type of screen is best for scalping . . . sizing . . . washing—and why Telsmith builds two types of four bearing screens and one type of two bearing screen. It describes each type; shows several new Telsmith Vibro-King features, including—new counterweight mechanism and new spring suspension, making it the smoothest and most efficient screen you can buy, either for scalping or finishing. Shows new heavy-duty tray construction; best methods for mounting screen cloth. Full of helpful pictures, diagrams and specifications.

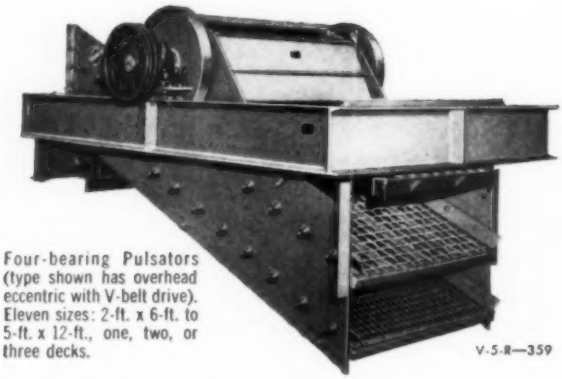
Get this NEW BOOK FREE—Ask for No. 290



Heavy-Duty Vibrating Grizzlies, with special screen trays for handling large-size aggregate. Three sizes: from 45-in. x 7 ft. up to 54-in. x 8-ft., one and two decks.



Two-bearing Vibro-King Screens—eleven sizes: 3-ft. x 6-ft. to 5-ft. x 16-ft., one, two, or three decks.



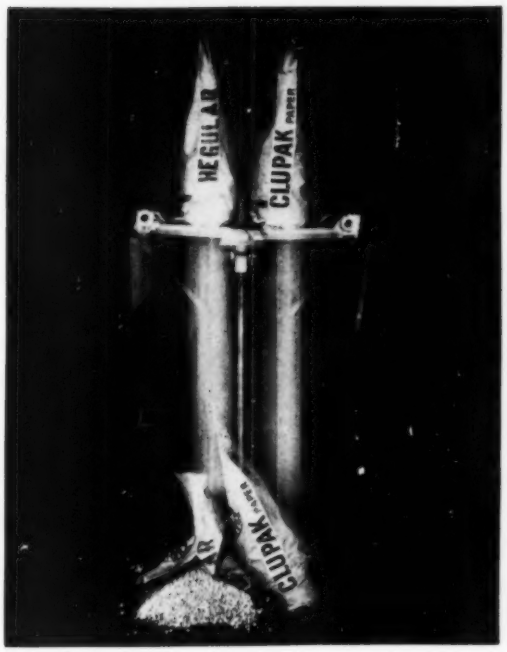
Four-bearing Pulsators (type shown has overhead eccentric with V-belt drive). Eleven sizes: 2-ft. x 6-ft. to 5-ft. x 12-ft., one, two, or three decks.

V-5-R—359

SMITH ENGINEERING WORKS

504 E. CAPITOL DRIVE **MILWAUKEE 1, WISCONSIN**

Representatives in Principal Cities in All Parts of the World • **Cable Address: Sengworks, Milwaukee**



Five-ft. butt drop tests illustrate the toughness resulting from the built-in stretch in Clupak paper.

● The Multiwall Big Division of the West Virginia Pulp and Paper Company is marketing multiwall bags made of stretchable paper for the shipment of cement and other rock and bulk products.

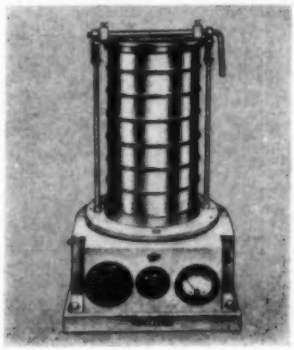
Called Kraftsman Clupak, the paper has greater toughness because of its ability to stretch under impact and absorb shock. In addition, the paper has a high modulus of elasticity and withstands considerable work before its strength is exhausted.

Greater toughness of multiwall bags made of Kraftsman Clupak paper keeps breakage to a minimum, both in the plant and in transit, and permits the use of less total weight for sacks and bags. Though stronger and tougher, the bags are lighter, and handle easily and smoothly on the filling lines.

Controlled amounts of stretch are built into the paper mechanically by a specially-designed extensible unit which can be installed as part of a standard paper machine in much the same way a size press or coating unit is added as an in-line operation.

West Virginia is presently producing stretchable paper in kraft grades, which are marketed under the brand name of Kraftsman Clupak paper. Multiwall bags made of Clupak paper are marketed under the trade name of "Wonderwall" through the company's Multiwall Bag Division. **(364)**

The **NEW** double action SYNTRON VIBRATING



TEST SIEVE SHAKERS

produce uniform, dependable, analyses, faster

SYNTRON'S New Electromagnetic Test Sieve Shakers provide a thorough analyses in less time than with older fashioned machines. Utilizing both up-and-down and rotating vibration, they produce a double vibrating action for faster testing.
SYNTRON Test Sieve Shakers produce quick, accurate analyses or accurately timed test periods. They are easy to operate and the absence of mechanical wearing parts assures dependability and low maintenance.

Write for free illustrated brochure

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Enter 65-A on card, page 139

UNSTICK stuck BINS

with new electro-permanent magnetic

ERIEZ HI-VI VIBRATORS

PAT. PEND.

Here's the newest and most efficient answer to those hard-to-move materials in sticky bins . . . designed to provide superior operating efficiency . . . exclusive pinpointed vibration gets right to the trouble spot – starts stubborn materials moving!

NO RECTIFIER NEEDED • COMPLETELY ENCLOSED HOUSING • GREATER VIBRATION IMPACT THAN COMPARABLE SIZE UNITS • RUGGED AND DURABLE • LOW FIRST COST • LOW OPERATING AND MAINTENANCE COST.

Special Mill Mutual ACCEPTED Units for HAZARDOUS DUSTY LOCATIONS

GET THE WHOLE STORY . . . WRITE TODAY. Eriez Mfg. Co., 113Q Magnet Dr., Erie, Pa.

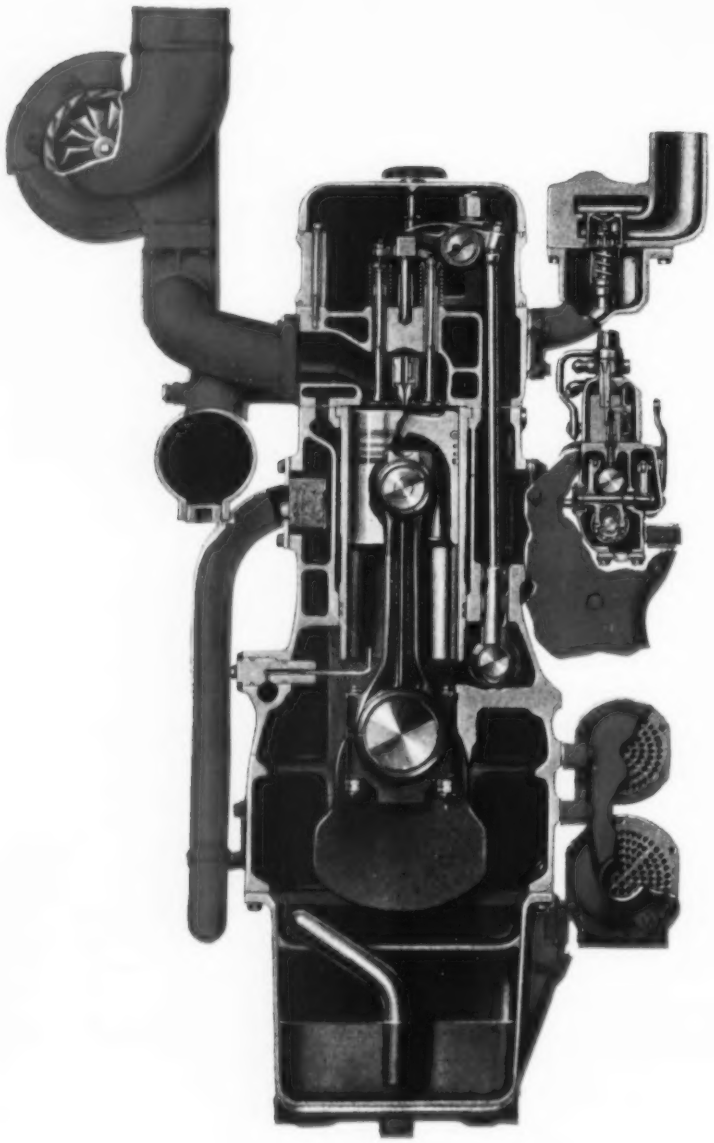
ERIEZ

Enter 65-B on card, page 139

NOW FOR THE FIRST TIME

NEW 385

INTERNATIONAL® UDT



Here's the all-new direct start 385 max. hp International UDT-817—a compact, heavy-duty 4-cycle, 6-cylinder engine thoroughly proven in six years of development and testing—backed by 26 years of experience in manufacturing and selling over 400,000 heavy-duty diesel engines.

Designed for versatile application in a wide variety of rugged pit and quarry applications, the UDT-817 answers the demand for dependable high power and lower cost operation on crushers, generators, dredge or sand and gravel pumps, drills, compressors, and for powering on-or-off-highway earth moving equipment.

A wide variety of accessory equipment including air cleaners, fly wheels for leading makes of torque converters and clutches, torque converter cooler, air control compressors, safety shut-offs, instruments and engine controls can be furnished to meet your installation requirements. Base, radiator, hood and dash, clutch and power take-off are available for complete power units.

For more specific information or application assistance, merely call your nearby International Power Unit Distributor or Dealer.

BRIEF SPECIFICATIONS

Type	4-cycle turbocharged
Bore and Stroke	5⅜ x 6"
Number of Cylinders	6
Displacement	817 cu. in.
Max hp	385 @ 2100 rpm
Rated hp	375 @ 2100 rpm
Max. Torque	1,040 lbs. ft. @ 1400 rpm
Compression Ratio	16:1
Weight	3,540 lb.
Lbs. per max. hp	9.2
Length, fan to flywheel	61½"
Height	56½"
Width	39½"
Flywheel housing SAE	No. 1

Enter 66 on card, page 139

hp.
817

FEATURES THAT ADD DEPENDABLE, ECONOMICAL POWER TO PIT OR QUARRY EQUIPMENT

- Fast direct starts with 24-volt electrical system.
- Direct injection of fuel under pressures to 20,000 psi by individual camshaft actuated multi-orifice injectors.
- Exclusive IH twin plunger metering pump directs equal and precise amounts of fuel to each injector in proper firing order according to load and speed demands.
- Turbocharger puts waste energy in exhaust gases to work for higher power output and lower fuel consumption.
- Dual intake and exhaust valves for free breathing efficiency.
- Positive valve rotators keep valve seats free of deposits.
- Aluminum alloy pistons working in replaceable wet cylinder sleeves with velocity swirl flow water cooling on outside, jet oil cooling on inside, for long life operating temperatures.
- Fully counterbalanced Tocco-hardened crankshaft with seven big main bearings and torsional vibration damper for smooth, dependable high power output.

International® Construction Equipment

International Harvester Co., 180 North Michigan Ave., Chicago 1, Ill.

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers and Bottom-Dump Wagons . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

EVERY TYPE OF CUT GEAR FOR EVERY INDUSTRIAL PURPOSE

SINCE 1888... We have been making many types and sizes of gears for industry. During these passing years we have derived considerable experience, trained numerous personnel, and expanded our mechanical and plant facilities—and have remained under one continuous management. We are ready to ably serve you.

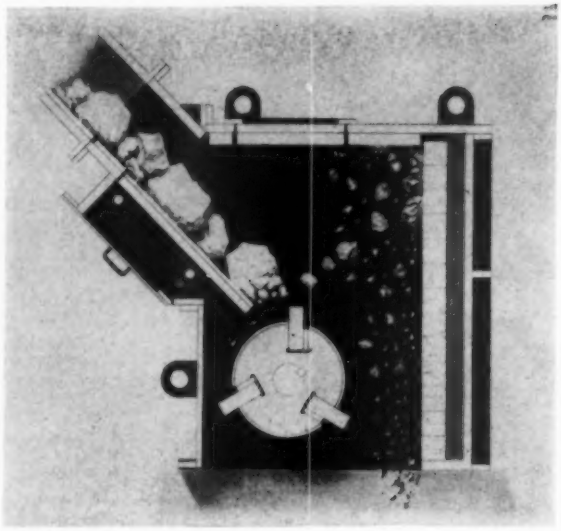
ESTABLISHED 1888

D.O.James

D. O. JAMES GEAR MANUFACTURING CO.
1140 W. Monroe Street, Chicago 7, Ill.

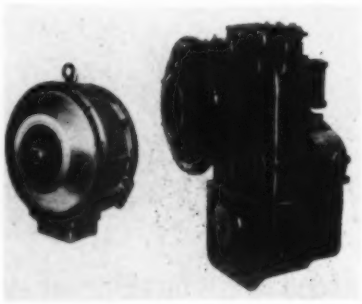
Enter 68-A on card, page 139

● The Jeffrey Manufacturing Company has introduced a series of secondary crushers which will accept as feed oversize screened-out material of the crushed product of primary crushers or medium-size initial feed, when the product of secondary crushers can be screened and overs recycled.



Feed openings vary from 24 x 12 to 36 x 30 in. The entire assembly is mounted in a heavy welded-steel frame and heavy cast manganese steel impeller bars securely fastened in the rotor.

Cross-section shows how the feed slides down the adjustable feed chute into the path of the revolving impeller bars and is hurled against the impact plate. (365)



● With the recent acquisition of the Hydra-Drives line of hydraulic torque converters and power shift transmissions from the Westinghouse Electric Corporation, the Rockwell-Standard Corporation now offers a complete line of drive line components for heavy-duty automotive equipment.

The Hydra-Drives torque converter is a single converter with a single reaction member. It has a 3:1 torque multiplication range, designed for use with standard transmission ratios.

The new power shift transmission unit consists of a torque converter and a power shift transmission in one integral housing. With four speeds forward and reverse, the unit is suited for vehicles that must travel in different directions during a normal work cycle. (366)

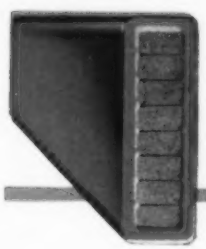
For Classifying Sand in Moderate or Large Volumes

Made by the Original Deister Company Established 1906

The CONCENCO® hydraulic classifier is made to sort sand grains sharply into any desired number of sizes . . . as many sizes as there are cells in the classifier. There are no moving parts, sorting is by hydraulic water only. Action is visible and easily adjusted for sharpest sizing. Giant models available for the handling of large tonnages. Send for full information.

THE DEISTER CONCENTRATOR CO. 911 Glasgow Ave., Fort Wayne, Ind.

Enter 68-B on card, page 139

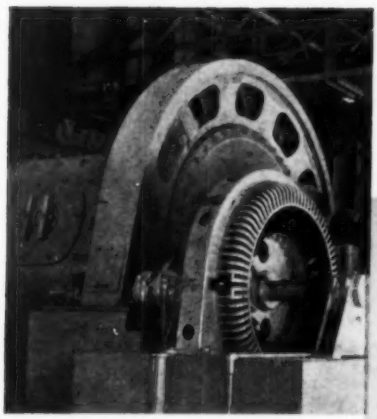


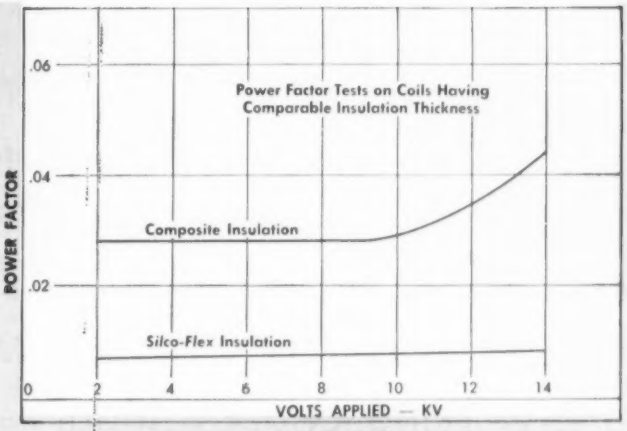
Super-Seal...

motor with void-free insulation

New motor withstands abrasion, physical stresses, moisture, heat aging...

revolutionizes motor protection practices in mining industry





The void-free nature of *Silco-Flex* insulated coils is demonstrated by power factor tests on *Silco-Flex* and composite insulations. Sharp rise in power factor of composite insulation above 9 kv is result of ionization of voids.

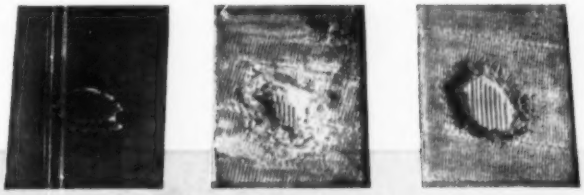
Remarkable new insulating systems combined with advanced mechanical features provide a completely new concept in motor protection — the *Super-Seal* motor. This revolutionary new motor gives you complete protection from moisture, abrasives and contaminants, even with so-called drip-proof motor enclosures.

New motor is protected with:

***Silco-Flex* stator coil** insulating system. A homogeneous, void-free dielectric barrier of vulcanized silicone rubber possessing a resistance to abrasives and most corrosive or chemical atmospheres. So moisture-proof it can be hosed down for cleaning.

Integrated field coils in synchronous machines are completely sealed against contaminants, bonded and locked against mechanical forces.

For additional information, call your nearby A-C office or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.



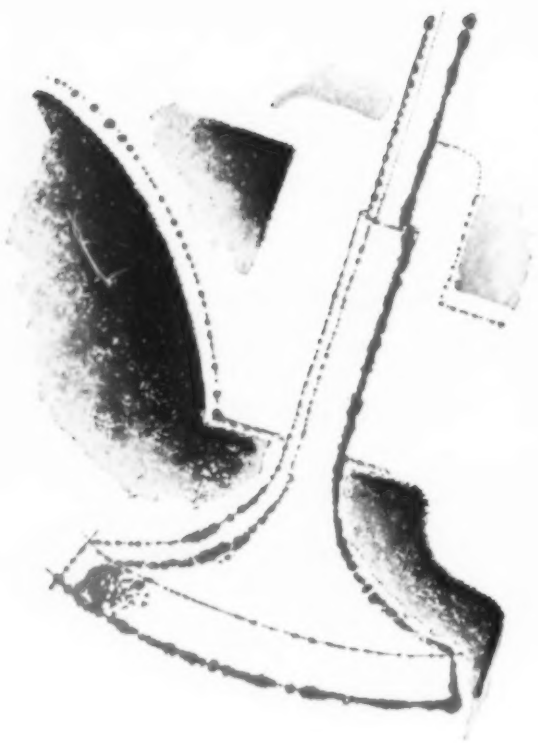
***Silco-Flex* Insulation** | ***Polyester* Mica Tape** | ***Asphaltum* Mica Tape**

Note difference in abrasion! Insulation shown after sandblasting for one minute with 90-grit aluminum oxide and 100-psi air from distance of six inches.

Super-Seal and *Silco-Flex* are Allis-Chalmers trademarks

ALLIS-CHALMERS

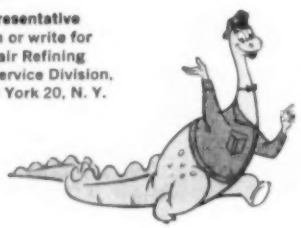
A-5736



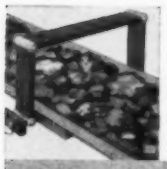
Valves... Oil... and How to Save Money

Valves which open and close hundreds of times a minute can cause lost money, time and power when deposits and wear start to take their toll. Sinclair Tenol® Oils fight deposits and wear—help keep vital parts working longer without repair. Refill with Tenol now. Next time management asks how you've cut costs, tell them you've switched to Sinclair—and show them the results.

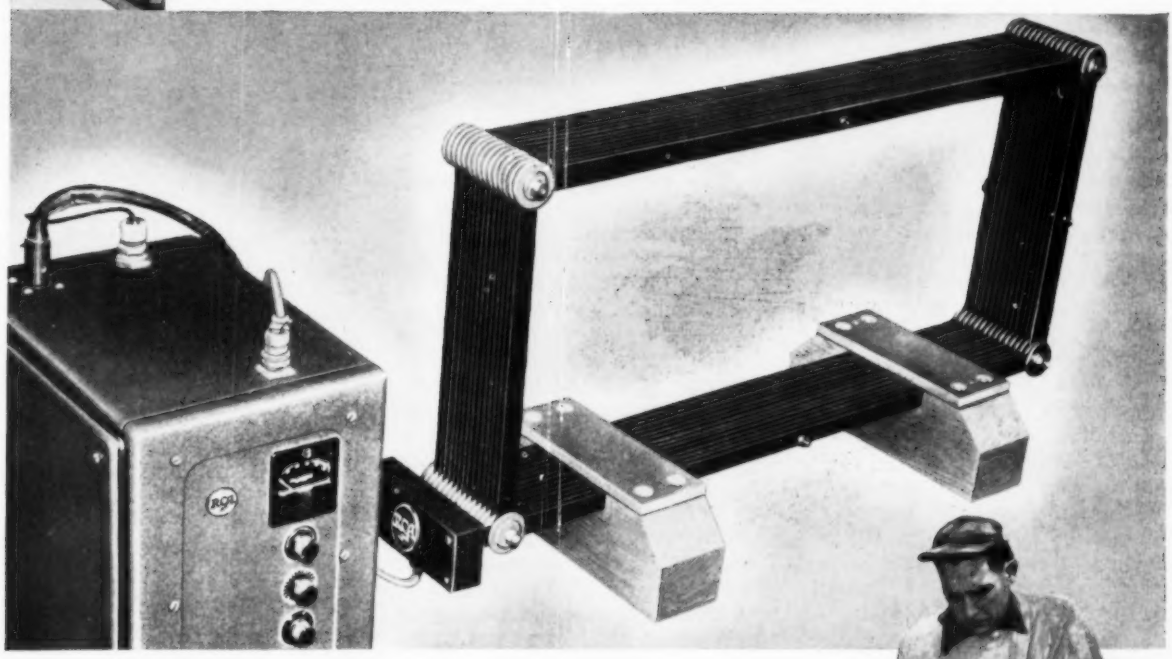
Call your Sinclair Representative for further information or write for free literature to Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N. Y. There's no obligation.



SINCLAIR
Tenol® Oils



...GATEWAY TO SAFETY FROM TRAMP METAL



New RCA Electronic Metal Detector Specially Designed for Quarries!

The new RCA Metal Detector aperture has been designed for heavy duty service and to withstand the rigors of humidity and moisture encountered in the quarry industry. Rugged components and built-in voltage regulation in the Control Unit provide efficient, trouble-free operation with a minimum of maintenance.

The basic system is made up of an inspection aperture of copper buss bar construction, and control unit. The aperture is available in a wide range of sizes to meet the requirements of various types of installations. Installation is made very simply around the conveyor belt, without need to dismantle the conveyor.

As the material passes through the aperture, the presence of tramp metal causes a signal to be amplified in the Control Unit. This signal is sent to a relay device which controls the motors of the conveyor, warning alarms or other types of rejection mechanisms. The simplified control system can be easily operated by your plant personnel. The RCA Service Company is available to provide supervision of the installation and offers a service contract.

"Detects the trouble that cripples crushers."

Locates tramp metal and sounds alarm. Protects valuable machinery against any metal object.

FREE *literature on the RCA Electronic Metal Detector for quarrying, mining, lumbering operations, will be sent to you without obligation. Write to RCA, Dept. R-236, Building 15-1, Camden, N. J.*

Tmk(s) ®

RADIO CORPORATION of AMERICA

CAMDEN, N. J.

In Canada: RCA VICTOR Company Limited, Montreal

Radio Corporation of America
Dept. R-236, Building 15-1, Camden, N. J.

☐ Rush details on the new RCA Universal Metal Detector.
☐ Have a representative call to survey plant.

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

Washington News

(From p. 11)

be expected to continue to live in the goldfish-bowl atmosphere in which they have operated for more than 25 years, ever since the time of the N. R. A.

By this time business leaders should be accustomed to this fact; but, unfortunately, they do not yet seem to have reconciled themselves to the fact that it makes very little difference whether the Administration is Republican or Democratic, or whether the Congress is controlled by one or the other party. Business, which is the most prominent aspect of American life, is the best target for investigators, particularly if the objective of the investigation is not only to learn more about business and its operations, but also to achieve political advantage.

Nor do these economic investigations constitute the total area in which business will be involved. The McClellan Committee has just received a renewal of its appropriation and can, therefore, be expected to be looking into racketeering of various kinds. Certainly, this committee has been very successful in focusing attention on labor racketeering; but in that process it has also involved a sizable number of business concerns.

Similarly, the Banking Committee has received funds to look further into anti-trust matters, and the Small Business Committee, under the chairmanship of Senator Sparkman, will continue to investigate many matters in which small business is interested. Frequently, the subject in which the members are most interested is big business. Here, the internecine warfare comes to the surface.

While it now appears unlikely that this session of Congress will achieve any special legislative records, a new high mark in investigations of all kinds may be reached in the next two years.

Labor Developments

(From p. 13)

while those who have been hired to replace them and who are most certainly not union members, are permitted to vote.

Of special interest to employers in the building and construction industry is the proposal in the Kennedy legislation to permit such employers to enter into agreements with labor organizations prior to the establishment of the union's majority status. This would legalize the actual practice which, for the most part, has never been changed under the Taft-Hartley Act, whereby employers on a building project agree with the union regarding recognition, wages, working conditions, etc., before hiring employees.

That proposal would also make "shakedown" picketing — that is, picketing to force an employer to buy off the union official involved— an unfair labor practice.

The labor movement is most interested in the proposal dealing with the right of economic strikers to vote, and the legalization of the current practice in the building and construction industry.

On the other hand, the Republican-Administration bill proposes quite different changes in the Taft-Hartley Act. Among these are (1) the strengthening of the curb on secondary boycotts; (2) the more rigid restriction on picketing so that unions could be enjoined from picketing a shop if they are unable to prove that the employees really wanted the union to represent them; and (3) the requirement that non-Communist affidavits be filed not only by union leaders but also by employers.

Of these proposals, the one of greatest interest to businessmen is the further curb on secondary boycotts which have proved so crippling to employers faced with the unhappy choice of giving in to a union demand or shutting down because deliveries are cut off.

The debate over the extent to which the Taft-Hartley Act is to be amended is providing a temporary road block to passage of the basic reform legislation. It may be necessary for either side (or both) to drop the extraneous provisions.

Labor Secretary Mitchell has already indicated that he would be willing to see the labor reform provisions separated and passed with other provisions incorporated in other legislative proposals. So far, the Democrats have made no similar concessions. It would indeed be regrettable to postpone or perhaps prevent the passage of this much needed labor reform legislation.

G. A. Gilbertson

C.I.M.A. Elects '59 Officers At Annual Meeting in Dallas

The Construction Industry Manufacturers Association, at its annual meeting of members at Dallas, Tex., January 21, 1959, elected the following officers for 1959:

G. A. Gilbertson, president, the Frank G. Hough Company, Libertyville, Ill., was elected president. Donald V. Buttenheim, publisher and president, Buttenheim Publishing Corporation, New York City, was named first vice-president, while W. C. Messinger, vice-president, Construction Machinery Section, Chain Belt Company, Milwaukee, Wis., has become second vice-president. Ray McLean, president, the Jaeger Machine Company, Columbus, Ohio, was elected treasurer.

Seven new directors were also elected to serve on the C.I.M.A. board for three years: A. G. Crockett, director, sales development division, Mack Trucks, Incorporated, Somerville, N. J.; R. L. LeTourneau, vice-president, sales, R. G. LeTourneau, Incorporated, Longview, Tex.; A. J. Lichtinger, executive vice-president, the Wellman Engineering Company, Cleveland, Ohio; J. A. Miller, president, Rosco Manufacturing Company, Minneapolis, Minn.; J. E. Mitchell, division manager, manufacturer sales, the Firestone Tire and Rubber Company, Chicago, Ill.; W. A. Nugent, executive vice-president, Thor Power Tool Company, Aurora, Ill.; Buel M. Wallis, vice-president, marketing, Schield Bantam Company, Waverly, Iowa.

Officers of the General Crushed Stone Company have announced the removal of their Philadelphia office to Glen Mills, Pa.

Enter 73 on card, page 139 →

since 1919 "Tool Steel Process" hardened products have established satisfactory service records in plants of the Lone Star Cement Corporation. They have effected savings in maintenance, replacement and downtime costs.

Lone Star uses many TSP Hardened Products including pins, bushings, herringbone ring gears, sheaves, bevels for kilns, screw conveyor gudgeons and bearings, shafts, track wheels, screw conveyor drive gearing, crane and general gearing, herringbone shaft pinions, brake wheels; ball, rod and masonry mill pinions.

TSP shines at LONE STAR

TSP products are hardened by our special process. The file hard surface to full depth of permissible wear gives maximum life. The core refined for toughness and ductility gives a maximum strength. Each TSP product carries a written guarantee that it will give a longer life in the same service than any other product.

THE TOOL STEEL GEAR AND PINION CO
CINCINNATI 16, OHIO, U.S.A.

The Standard of Quality Since 1909
for Gears • Pinions • Rolls • Wheels and Other Hardened Products

Printed in U.S.A.
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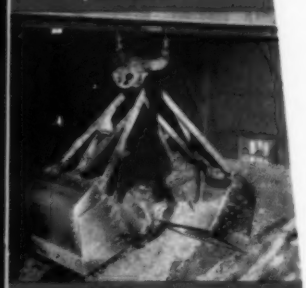
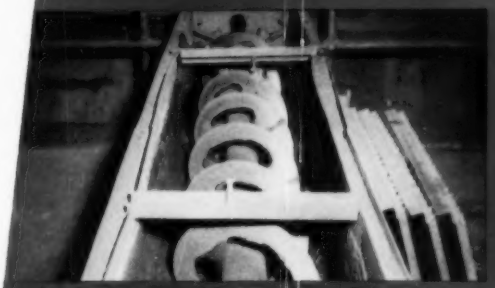
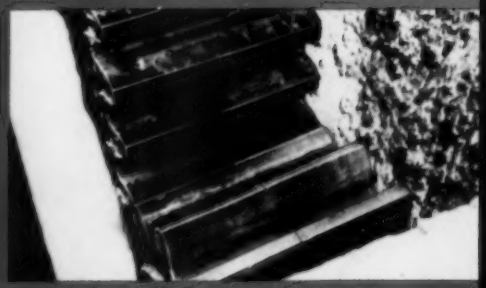


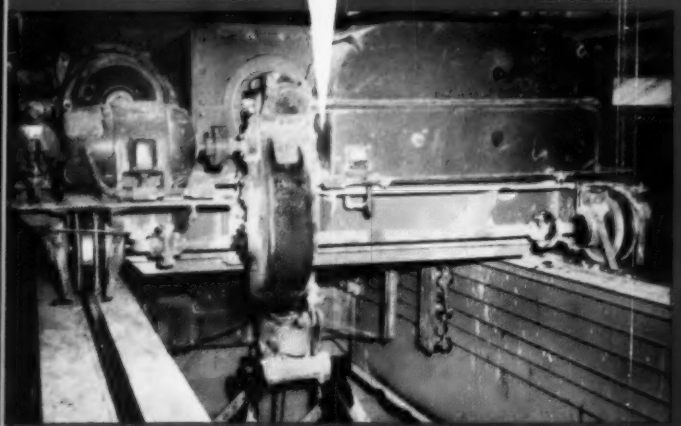
TSP Sheaves on overhead cranes



TSP Gudgeons and Bearings on screw conveyors



Close-up of masonry mill drive pinion and bull gear



TSP Wheels and Gearing on 3 yd. bucket cranes

TSP Drive Pinions on rod, ball and masonry mills

Drills up to 30 feet an hour in granite

MISSION HAMMERDRIL

Trade Mark

Bottom Hole Impact Tool

Patents issued and pending

The Mission HAMMERBIT

Here's the economical answer to high speed drilling in hard rock. The HAMMERDRIL® is economical because of its design—only two moving parts in the high pressure tool, and only three moving parts in the low pressure tool. Economical because impact parts are heat-treated high alloy steel, moving parts are friction and wear resistant. Economical because you can use it on your present rotary rig with suitable air compressor capacity. Mission HAMMERBITS® feature massive tungsten carbide inserts which can be *resharpened in the field.* The HAMMERDRIL with the HAMMERBIT cuts the cost per foot of drilling every foot through hard rock.

The Mission HAMMERDRIL is sold and serviced throughout the United States. Write to Mission for more information on what the HAMMERDRIL can save you—actual field savings under field conditions.

Nothing but the finest will bear the name of MISSION MANUFACTURING CO

Serving the Petroleum Industry for Over Thirty Years

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BILL'S IN A SIZZLE

an ordinary tire "blew" the job

but BOB'S ON SCHEDULE with

U.S. ROYAL SAFETY 1st TRUCK TIRES

service-proved against job delays!

Here's a fact proved at strip mines, sandpits, quarries and construction projects by the hundreds. The best way to prevent costly tire delays and keep hauls *on schedule* is to use U. S. Royal Off-Road Tires!

Here's why. First: today's U. S. Royals give you exclusive, advanced features that pay off in extra traction, greater strength and longer wear. Second: these great new tires are backed up with on-the-spot know-your-stuff *service*—including complete and expert *retreading*.

Find out exactly how easily and quickly *you* can cut job delays with these service-proved tires. Call your U. S. Royal Dealer. Or better still—specify "U. S. Royal" on your next new equipment!

U.S. ROYAL CON-TRAK-TOR®—for rugged operations where utmost traction's required

U. S. ROYAL Super FLEETMASTER—for severe service on all your off-the-road trucks

U.S. ROYAL FLEETMASTER®—Dual Purpose, Nylon—top pull *and* mileage on *and* off road

U. S. ROYAL NYLON TIRES ARE TOUGHER, STRONGER, SAFER—

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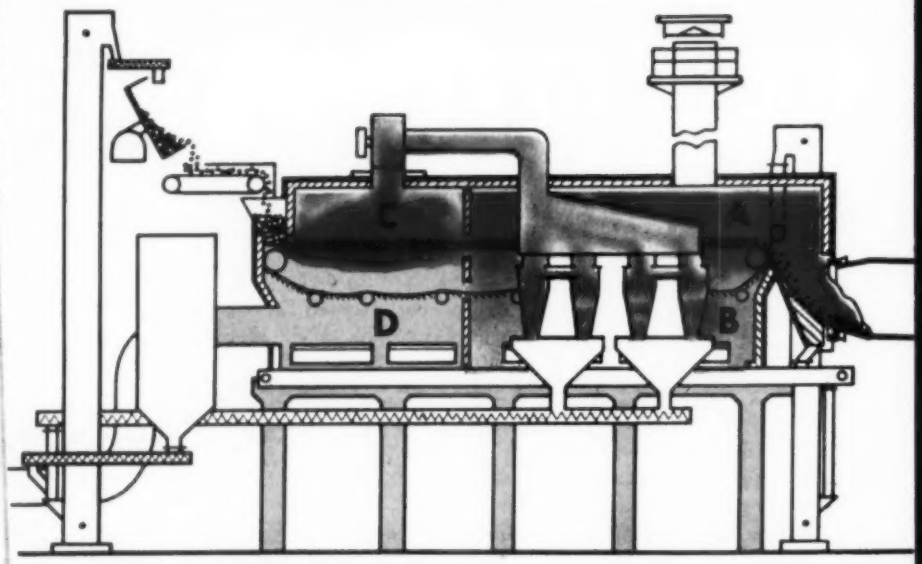
Rockefeller Center, New York 20, N. Y.

In Canada: Dominion Rubber Co., Ltd.

Clean and...
EFFICIENT

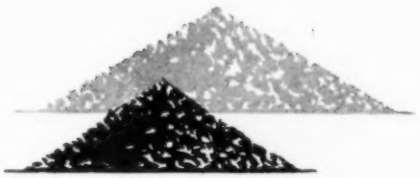
THE
ACL
SYSTEM



ACL is an Allis-Chalmers trademark.

Plan to stay ahead... MODERNIZE!

A new concept in cleanliness! The new *ACL* system offers lower dust loss — cleaner cement production. Stack discharge is merely a wisp. Complete dust-free plants have been constructed within large cities and in suburban neighborhoods. The system meets even the most stringent municipal air pollution codes. Other advantages are: maximum burning efficiency, reclamation of material, power savings and small space requirements.



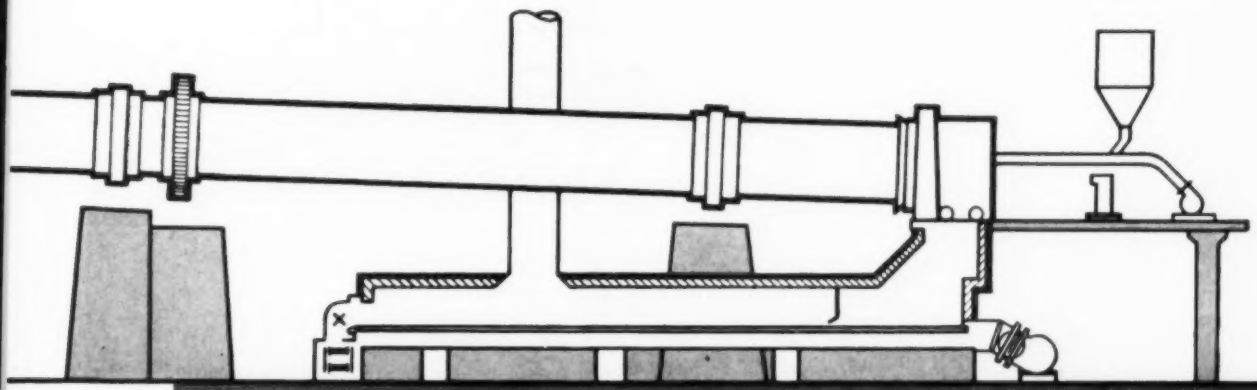
40% less fuel per barrel of clinker

ACL systems now in operation consume fuel at an average of 600,000 Btu per barrel of clinker. Compare this to fuel requirements of conventional long, dry-process kilns which use from 800,000 to 1,000,000 Btu. And the *ACL* double-pass system is designed to use any conventional fuel—powdered coal, fuel oil, natural or coke oven gas.

For details, ask your A-C man for a copy of Bulletin 07B8431. Or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin.

How the *ACL* double-pass system works

Partial calcining and dust reclamation take place as hottest gases pass through pellet bed on traveling grate. Gas temperatures are reduced from about 1800 to 500 degrees in this first pass (A to B). Next, gases pass through cyclones where larger dust particles are removed, and carried back to pelletizer. Final dust filtering takes place as gases pass through moist pellets on feed end of grate. In the second pass (C to D) gas temperatures are reduced more. Heat of kiln gases is transferred to material.



ALLIS-CHALMERS

Enter 74 on card, page 139

US RUBBER CONVEYOR BELTS

"They proved themselves in our first 10 plants, so we picked them for our 11th!"

says director of sand and gravel company

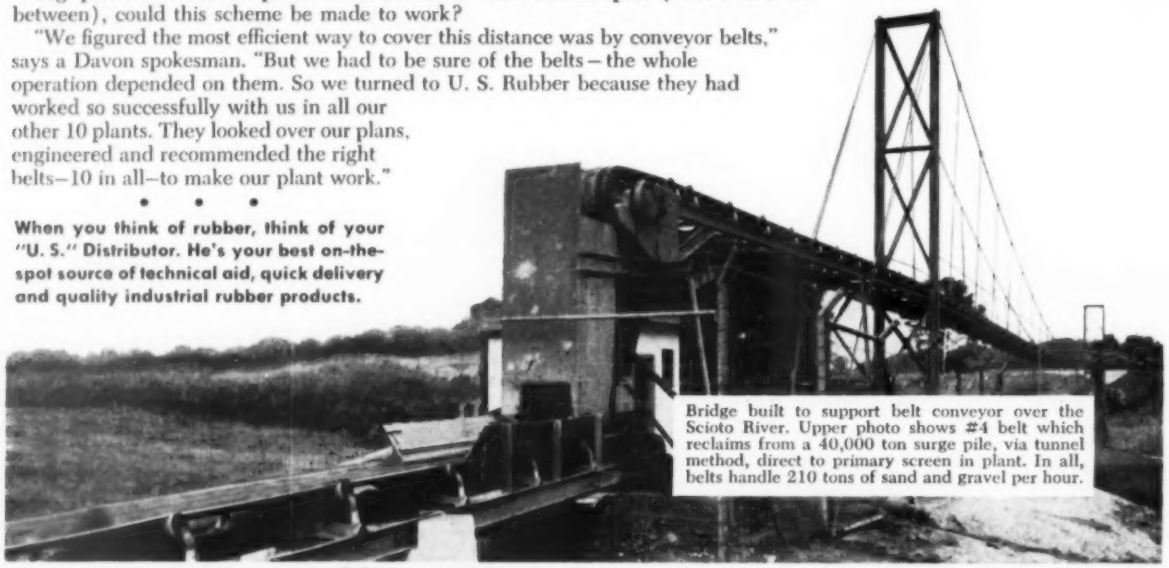
When Davon, Inc., built its 11th plant recently, they decided it would be more economical to bring the material to the plant rather than the plant to the material.

Big question: Since the plant and material were half a mile apart (with a river in between), could this scheme be made to work?

"We figured the most efficient way to cover this distance was by conveyor belts," says a Davon spokesman. "But we had to be sure of the belts – the whole operation depended on them. So we turned to U. S. Rubber because they had worked so successfully with us in all our other 10 plants. They looked over our plans, engineered and recommended the right belts–10 in all–to make our plant work."

• • •

When you think of rubber, think of your "U. S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality industrial rubber products.



Bridge built to support belt conveyor over the Scioto River. Upper photo shows #4 belt which reclaims from a 40,000 ton surge pile, via tunnel method, direct to primary screen in plant. In all, belts handle 210 tons of sand and gravel per hour.

US RUBBER

Mechanical Goods Division

United States Rubber

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The 1958 Economic Census

INDUSTRIAL and business concerns were recently notified by the Bureau of Census, U. S. Department of Commerce, of the coming Censuses of Manufacturers, Mineral Industries, and Business for 1958. These will show the growth of the nation's industrial and distributive system over the last four years, the last such censuses having been for 1954. Distribution of the forms to be filled out has already begun. Through the use of improved electronic computing equipment, the Bureau expects to publish preliminary figures on these censuses before the end of 1959. It is anticipated that all final reports will be available before the end of 1960.

Complete enumeration of the nation's manufacturing and mineral industries, and wholesale, retail, warehousing, and selective service trade establishments was last conducted for 1954. The last previous censuses had been made from 7 to 15 years earlier. By federal law these censuses are authorized to be conducted in 1959 relating to 1958 business activity, and every fifth year thereafter. The same law makes reporting mandatory, but also protects the respondent from disclosure of his figures.

THE Census of Manufacturers supplements current commodity surveys and an annual survey which is conducted each year on a sample basis. These provide product detail of the type required by a complete census; so the present Census report forms have been limited to the summary totals of such items. The inquiries on the report forms for the Census of Mineral Industries in general are intended to yield information comparable to the same types collected in the census of 1954 and will be closely co-ordinated with the statistical programs of the U. S. Bureau of Mines. They will seek only that information on products which will assure adequate industry and type of operation classification of the census reports, and also a measure of net and gross shipments. The Census of Business will have two types of forms in each business category, one for single-unit companies and the other for multi-unit firms.

All reports are kept strictly confidential; they will be classified, tabulated, and finally published in such form that the operations of no single firm will be revealed. What you submit will be seen only by the Bureau's sworn employees, who are by law subject to severe penalties for disclosure of information that would reveal data on individual operations.

THESE censuses are required by a law, enacted by Congress in 1954 under strong pressure from business; and business should now co-operate fully. Any delay in returning completely filled out forms will necessitate expensive and time-consuming follow-ups. Inaccuracy in filling out the forms will, where apparent, also require following up, and will in all cases reduce the value of the census results to business.

We again strongly urge all producers and manufacturers to co-operate fully in these censuses. We also suggest that those not now keeping adequate records of their businesses do so at once for their own benefit, and so that they will be able to fill out these questionnaires when they are received. After all, these censuses are being made primarily for your benefit, and full use of this valuable information should be made when it becomes available.

Walter E. Frauffer

New Weston & Brooker Crushed Last Word in Design

ANOTHER ON THE SPOT REPORT

PROBABLY the last word in crushed stone production is the new Ruby plant of the Weston & Brooker Company near Mcon, Ga. In the experience of this writer it comes as close as any to the popular concept of a modern, flexible, and automatic plant. It was designed for a steady capacity of 500 t.p.h. of crushed granite in a wide variety of sizes, and this figure has already been exceeded. The excellence of the design is evident throughout, particularly in the attention to details which are normally overlooked.

The company had for some years operated plants at Sparta and Camak in Georgia, and its original plant at Cayce, a suburb of Columbia, S. C. These operations served a wide area, but in recent years the southwestern Georgia market expanded and required increasing quantities of crushed stone. Finally, in order to serve this area more economically, it was decided to build a plant closer to this market. A careful survey located a suitable deposit 9 miles east of Gray and 9 miles north of Macon, Ga., in Jones County.

The clearing of the property was begun in July, 1956, and the plant was fully completed in June, 1957. The planning of the plant, the procuring of materials and equipment, and the construction were so executed that the quarry, the primary and secondary crushing departments, and the raw dock storage were in operation well ahead of the complete plant. In this way the quarry was sufficiently developed and enough material was in storage for full operation.

Features Some of the features of this outstanding operation follow. The primary crushing station is located near the center of the deposit. Structures and location of equipment there, and throughout the plant, are designed for accessibility for easy inspection and minimum repair or replacement time. The riprap station following the primary crusher removes this large rock with the minimum of handling. The large (23,000 tons live) raw rock storage keeps the two sections of the plant independent of each other.

Opposite page: An air view of the Weston & Brooker plant near Macon, Ga. The primary crusher is at the right, raw storage is at the center, and products storage is in the left background.

aim for modern, flexible, efficient "new from the ground up" plant realized

Granite Plant

By WALTER E. TRAUFFER

One of the two 3-cu. yd. shovels loading a 15-ton rear-dump quarry truck.

A truck dumping to the pan feeder ahead of the 60- by 48-in. jaw primary crusher.

The use of dual reclaiming tunnels under the finished material stockpiles and dual loading systems is unique, permitting the loading of cars and trucks simultaneously, or the return of stored material for further reduction by one system while the other is used for loading. Control of feeding and proportioning in the tunnels is by means of pushbuttons in the loading tower.

Another feature is the standardization of equipment in this and the other plants. This fact and the proximity of the plants to each other makes it possible to maintain a comparatively small inventory of expensive parts at one location for all of them. All pits are reinforced concrete and self draining. Surge hoppers are provided at key points such as ahead of the secondary

This view shows conveyor No. 1 from the primary crusher to the riprap loading station and conveyor No. 2 to the secondary crushing station.

crusher, the scalping screens, the tertiary crusher, and the car- and truck-loading stations.

Prospecting A prospecting crew under Douglas Castleberry, now superintendent of the Ruby plant, explored this area and located this deposit through an outcrop. About 2,000 holes were drilled to locate the rock and overburden, and enough core holes were sunk to prove satisfactorily the quality and quantity. The rock is a metamorphic granite gneiss which has a Los Angeles abrasion test of 22; it is medium-grained and light in color, with a low specific gravity. About 400 acres of the property has been proved, and holes have been drilled 200 ft. deep without penetrating the rock.

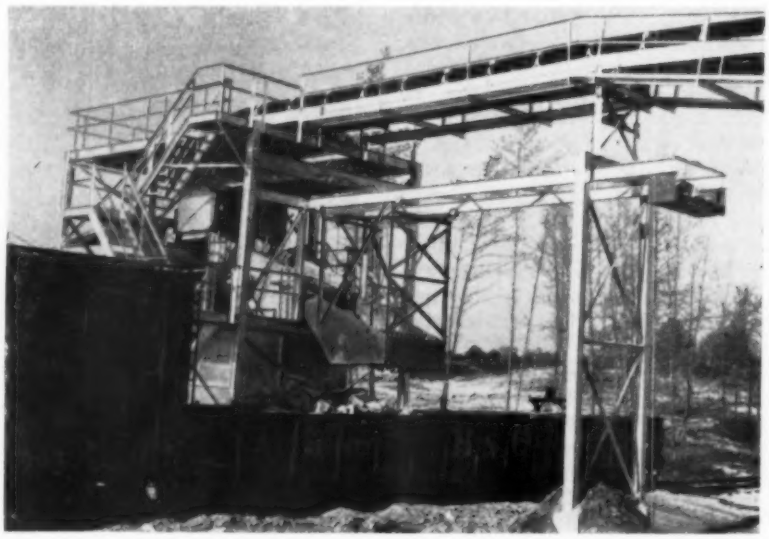
Quarrying The overburden averages 20 ft. in depth and most of it has been removed by contract. Some is removed with company equipment during off seasons. The quarry is being developed on an original plan, with the primary crusher located in the approximate center of the area to be worked. There is an earth fill ramp to the primary crusher and it can be extended around as the quarry development progresses. The fill has a maximum grade of 8 percent and has ample area for truck turnaround.

The quarry was opened at one side of the crusher, and a 40-ft. face is being developed for most effective blasting and operation. In the far corner a quarry drain area is being developed 40 ft. below the quarry floor on a 12 percent grade. An automatic deep-well pump feeds to a creek leading to a dammed reservoir which insures an adequate water supply for the plant.

Drilling is done with two Joy TM 500 Challenger drills with 4-in. tungsten-carbide X-bits and 2-in. steel. These bits have been found to be most effective for this rock, which is not difficult to drill and shoots and breaks well. Drill holes are spaced 12 by 12 ft., and shots are about 60 holes in three rows. Holes are loaded at the bottom with 40 lb. of 60-percent semi-gelatin, and the balance is 40 percent ammonia. Holes are wired in parallel series with millisecond-delay caps, and detonation is by a Du Pont blasting machine. Some secondary shooting is done, and block-holes are drilled with Atlas Copco jackhammers. An 8,000-lb. dropball, operated by a 1½-cu. yd. Marion 462 crane, is also used. Air for the drills is supplied by Ingersoll-Rand 600 Gyro-Flow compressors.

Quarry loading is done by two identical 3-cu. yd. Bucyrus-Erie 71B diesel-powered shovels with torque converter drive. These load the rock into four 15-ton 80-FD Euclid rear-dump trucks which are

A closeup of the riprap station, showing scalping screen oversize being loaded direct to railroad cars.

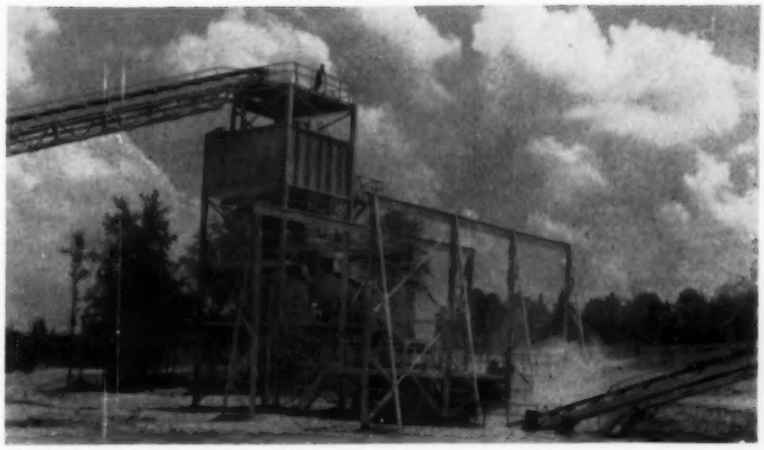


driven by 200-hp. Cummins diesel engines. A recent addition is a 25-ton Mack LVX truck with a 300-hp. Cummins diesel. The haul to the plant is about 1,000 ft.

Primary Crushing At the plant hopper the feeder man controls a signal light. When it is red, the truck waits; and when it turns green, he dumps his load at once. This signal system alone is credited with 10 additional truckloads daily by eliminating the usual delays. The trucks discharge into the 60-in. by 21-ft. Pioneer feeder which has Oro manganese steel pans. This feeder is driven by a 4-speed 20-hp. motor, pushbutton controlled for inching, speeding up, or stopping. It discharges into the 60- by 48-in. Allis-Chalmers Blake-type jaw primary crusher, which is driven through V-belts by a 200-hp. Allis-Chalmers motor. The minus 8-in. crushed product is discharged onto 42-in. by 284-ft. 5-in. centers belt conveyor No. 1, which has Continental Gin impact idlers at the feed end.

A 40-ton guy derrick has been installed at the primary crusher for handling crusher parts, and a 7½-ton Hevi-Lift hoist suspended from it operates a stone hook. Originally, the hoist was operated from the boom of a Marion crane.

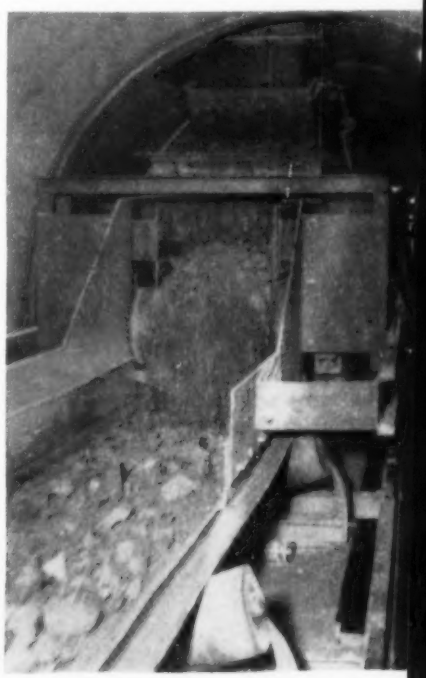
Riprap Conveyor No. 1 leads to a specially-designed riprap station (No. 2) from which cars can be loaded direct. Rock is discharged into an automatically-positioned rock box which ordinarily lets all the rock flow direct to conveyor No. 2 in the plant flow. When riprap is to be loaded out, the box is positioned to feed all the rock onto a 5- by 12-ft. Allis-Chalmers Ripl-Flo single-deck screen which has cast-manganese steel plates with 8½- or 9½-in. round openings. The oversize (riprap) is discharged into railroad cars *via* a discharge chute which is pushbutton-controlled for three positions. Throughs go to conveyor No. 2.



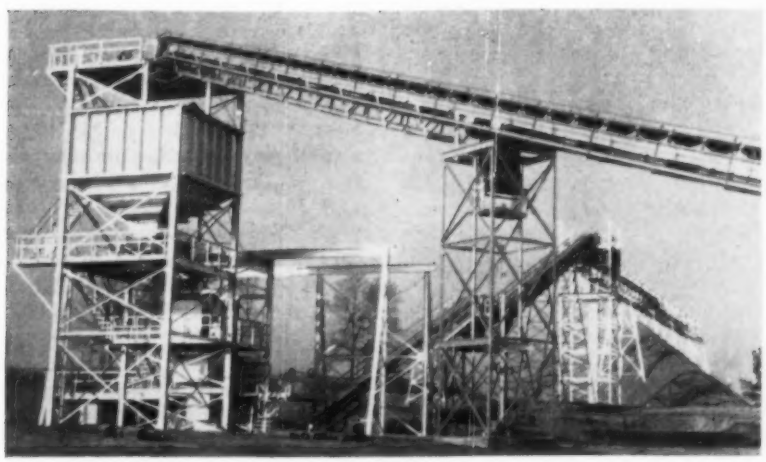
Conveyor No. 2 feeds to the surge hopper at the secondary crushing station. Below are the scalping screen and the cone crusher feeding to conveyor No. 3.

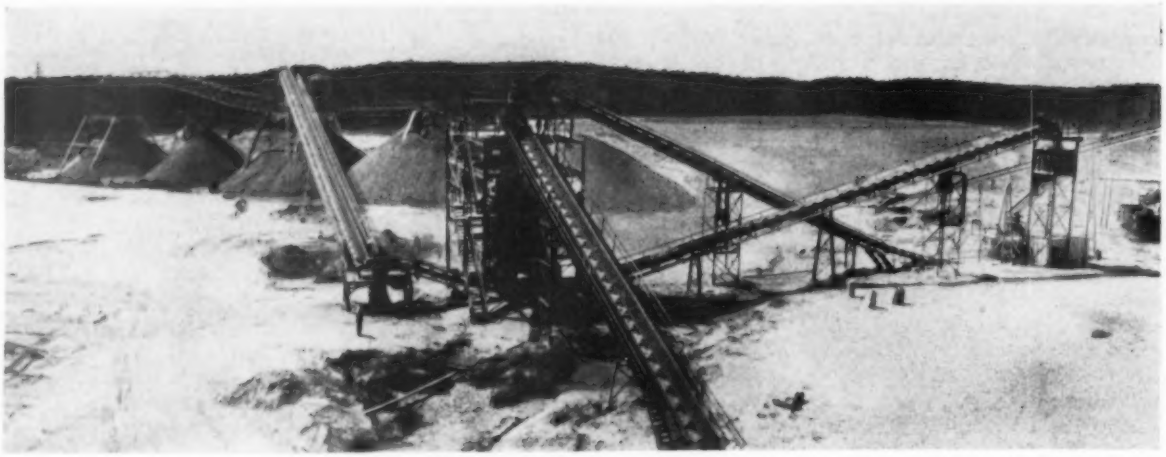
Secondary Crushing Belt conveyor No. 2 is 42 in. wide and 199 ft. 9 in. long and discharges into a 75-ton steel surge bin at the secondary crushing station (No. 3). Feed to the crusher is by means of a 48-in. Pioneer pan feeder driven by a 4-speed push-button-controlled motor. This provides a uniform flow which can be adjusted to give the best feed rate for different conditions, such as gradation, weather, etc. The stone is discharged on a 5- by 12-ft. Allis-Chalmers 1-deck ROM screen over the crusher, which by-passes minus 3-in. material. The plus 3-in. oversize from the screen is discharged into the 7-ft. Symons standard cone secondary crusher. The by-passed

The movable belt feeder which serves 15 openings in raw storage tunnel.



Another view of the secondary crushing station, with conveyors No. 3 and 4 (background) to the 300-ft. raw rock storage bridge.





A general view of the scalping station, fed from raw storage. The recrushing station is at the far right. In the left background are two screening stations over the products storage.

material and the crusher product, both minus 3-in., are discharged together on belt conveyor No. 3.

Raw Storage Conveyor No. 3 is 36 in. wide and 151 ft. 8 in. long and discharges to conveyor No. 4, which is identical. Two conveyors are used in place of one longer one. They carry the rock to the primary storage bridge (Station No. 4), which is 300 ft. long and 50 ft. high. A horizontal stationary conveyor (No. 5), 36 in. wide and 143 ft. long, delivers the rock to the middle of the tower. There it is discharged on 36-in. by 130-ft. shuttle conveyor No. 6, which is reversible and can be moved in either direction to discharge at any point the length of the bridge. Pushbuttons control the movement and spotting.

The rock is discharged over an 8- by 8-ft. reclaiming tunnel built of special prefabricated reinforced concrete sections made by the Macon Prestressed Concrete Company, with design and forms supplied by Weston & Brooker. These sections are similar to an 8-ft. culvert, but they have vertical sides and they rest on a concrete slab graded for self drainage. The stockpile has a capacity of 45,000 tons, of which 22,000 is live storage without rehandling. The top of the tunnel has 15 openings (20- by 20-in.) spaced 20 ft. apart. Rock is withdrawn through clamshell gates to a belt feeder of the company's own design, running on rails, which is moved to any desired gate by push-button control on the machine. The feeder has a Link-Belt P.I.V. variable-speed drive, so that compensations in feed rate can be made due to gradation, moisture, etc.

Scalping The 36-in. tunnel reclaiming tunnel (No. 7) is 343 ft. long. It discharges to a 36-in. by 174-ft. 2-in. belt conveyor No. 8, which carries the stone to the scalping station (No. 5). There the stone is discharged into a rock box over two 5- by 14-ft. Ripl-Flo 2-deck screens. Pushbuttons control the discharge gates for any of three flows—all material going to the No. 1 screen, all going to the No. 2 screen, or split to both, which is the normal flow. This arrangement permits making special sizes over one screen while making standard sizes over the other. A combination of split chutes makes it possible to produce special sizes of almost any desired specification. The screen openings are varied due to weather conditions, etc.

Recrushing Oversize from scalping screen No. 2 is carried on 30-in. by 15-ft. 6-in. conveyor No. 11 to a rock box which also receives direct the oversize from screen No. 1. This material is then carried on 30-in. by 176-ft. 2-in. conveyor No. 9 to the tertiary crushing station (No. 6). There it is discharged into a 35-ton. steel bin, from which it is fed through a chute with a slide gate to a 5½-ft. Symons shorthead cone crusher. The minus ½-in. product of this crusher is returned on 30-in. by 196-ft. conveyor No. 10 to the scalping screen feed box at station No. 6.

A split chute under either screen makes it possible to send material through the bottom deck to the tertiary or reduction crusher circuit. This can be done to make minus 2-in. stone when that is standard, or whatever is the maximum plant size.

Special Products The stone retained on the bottom deck of screen No. 1 is carried on 30-in. by 33-ft. 6-in. conveyor No. 30 to a rock surge box which also receives direct the material over the bottom deck of screen No. 2. This material is discharged by 30-in. by 156-ft. 8-in. belt conveyor belt No. 15 to a 4,000 ton stockpile over the main reclaiming tunnel. This is known as the specialty circuit.

Fine Screening The material through the bottom of screen No. 2 is carried on 30-in. by 34-ft. conveyor No. 12 to a rock box which also receives direct the throughs from screen No. 1. A 30-in. by 30-ft. 6-in. belt conveyor, No. 13, followed by 30-in. by 260-ft. conveyor No. 14 carries this material to a screening station (No. 7) over the main reclaiming tunnel.

There are now two screening towers over this tunnel, but it is planned eventually to have four towers. At tower No. 1 there is a

The scalping station (right) and the tertiary crushing station (center). At the left is the car- and truck-loading station.

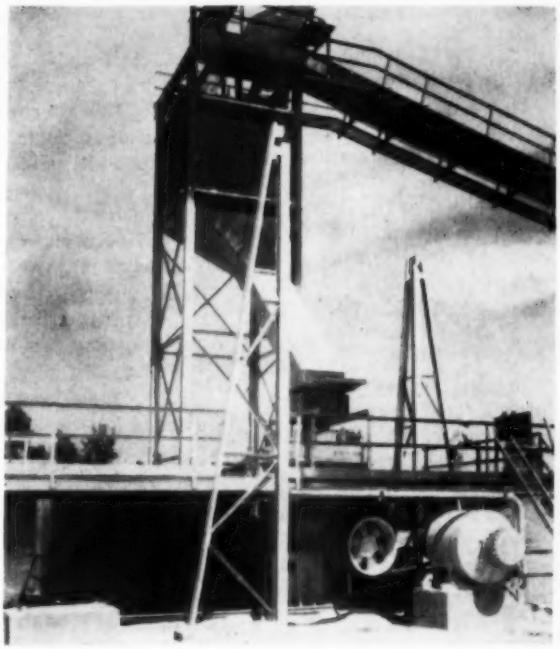
5- by 14-ft., Ripl-Flo screen (No. 3) which has ¾- and 9/16-in. openings on its two decks. The 1¼- to ¾-in. oversize goes to a 63-ft. 6-in. horizontal conveyor (No. 17), which discharges it into the second of the five 4,000 ton stockpiles over the reclaiming tunnel.

The ¾-in. to 9/16-in. stone off the second deck of the No. 3 screen goes to the third stockpile.

The minus 9/16-in. material through the bottom deck of screen No. 3 is carried on 30-in. by 151-ft. belt conveyor No. 18 to screening tower No. 2. There it is discharged on a 5- by 14-ft. Ripl-Flo 2-deck screen (No. 4). This usually has ⅜-in. square and 5/32-in. round punched plate. The 9/16- to ⅜-in. material off the top deck goes to 24-in. by 63-ft. 6-in. horizontal stockpiling conveyor No. 19, which discharges it onto stockpile No. 4. This conveyor is suspended from the truss which supports conveyor No. 18 between the towers.

The ⅜- to ⅛-in. material off the bottom deck of screen No. 4 drops direct to stockpile No. 5.

The minus ⅜-in. material through the bottom deck is now being carried on a 24-in. by 60-ft. conveyor to the screenings storage area. This ground stockpile has a capacity of about 60 tons. As only part of this product at present finds a market, a Caterpillar D7 bull-



A closeup of the tertiary or recrushing station with the 5½-ft. cone crusher.

The two screening stations over the main products storage, with the two boom conveyors to storage.

The car- and truck-loading station, where blending and reclaiming controls are also located.

dozer and a Michigan 125A front-end loader move it to a waste area.

Product Storage The eventual storage and reclamation system will consist of four screening towers with eight stockpiles over two parallel 684-ft. long reclaiming tunnels. For the two existing towers only 428 ft. of the two tunnels has been completed. The 36-in. reclaiming conveyor (No. 24), which will be 704 ft. 7 in. long, is now 444 ft. long. The tunnels are identical, the raw storage tunnel being built of 8-ft. by 8-ft. precast sections.

As in the other tunnel, there are 20- by 20-in. openings every 20 ft., which make it possible to reclaim about 50 percent of the stored material without rehandling. Each opening is equipped with sliding gates. Five Syntron electric vibrating feeders, one for each stockpile, can be moved on a track to any of the openings. All are motorized, with pushbutton control. Each feeder has two trail cables and polarized plugs, with sockets every 40 ft. One cable is used for power, and the other for control of amplitude of vibration from the loading head. This makes it possible to load out any desired sizes or blends and change to any other without entering the tunnel.

The 36-in. by 444-ft. tunnel reclaiming conveyor (No. 24) is inclined at its discharge end to feed above ground level and discharge on 36-in. by 138-ft. 5-in. inclined conveyor No. 25 to the loading tower (Station No. 8). There it discharges into a three-way rock box.

The conveyor in the second reclaiming tunnel, a duplicate of No. 24, will be put in operation during 1959. It will discharge to a second inclined conveyor paralleling and duplicating No. 25. This second reclaiming system will be used primarily to return stored finished sizes for recrushing but it can also be used for loading out. This will make it possible to load out two different materials at one time, or to recrush one size while loading out another.

Recrushing Circuit For recrushing material, the rock box can now discharge to 30-in. by 115-ft. 5-in. inclined belt conveyor No. 16, which returns it to the bin at the No. 6 tertiary or recrushing station. This circuit permits reduction of inventory of any slow-moving product at any time, or the possible rerun of dirty material during rainy seasons, etc. Later the second tunnel reclaiming system will have a rock box for feed to this circuit or for loading out.

Loading For car-loading the material is discharged from the box direct to a 5- by 12-ft. Ripl-Flo single-deck washing screen equipped with Chain Belt Rex sprays. The washed rock is discharged to 30-in. by 12-ft. 3-in. shuttle belt conveyor No. 26. This is located as low as possible for car-loading, to minimize segregation and degradation, and rolls back out of the way to clear locomotives.

A similar screen is used to rinse stone for truck-loading, which is also done by a 30-in. by 12-ft. 3-in. shuttle conveyor (No. 27).

The stone being loaded either into cars or trucks is weighed by a Builders-Providence Conveyo-Flo conveyor scale on conveyor No. 25 ahead of the rock box. This operates by means of a pneumatic load-sensing device which integrates weight and belt speed into pounds. The weight is shown on a counter at the loading foreman's station. This is a large steel-and-glass-enclosed room in which the blending controls are located, as well as a complete set of stone-testing laboratory equipment.

Other Electric power is received at 44,000 v. and is stepped down at a transformer station to 550 v., 3-phase, 60-cycle, which is used for all plant motors. This voltage is commonly used by most other industries in the area. Distribution to the various plant departments is through Neoprene-insulated cable direct, buried in 3-ft. deep trenches filled in with screenings. Interlocking controls are used where safety requires it.

Conveyor idlers and pulleys are by the Continental Gin Co.; the belting is divided between Goodrich and U. S. Rubber; and Falk gear reducers are used. All electric motors are Allis-Chalmers, totally enclosed and fan-cooled, and the switchgear is Allis-Chalmers and General Electric. All screens (Allis-Chalmers) are oil lubricated, which eliminates frequent greasing. Most of the structural steel was furnished by the Merts Equipment Company.

The plant was designed and built under the direction of Luther J. Burriss, then chief of engineering and procurement, and now vice-president of operations. He was assisted by Douglas Castleberry, now superintendent of the plant, the late J. M. Pruden, then structural engineer, and the late Charles Grinstead, then production superintendent. Brooks Guy is mechanical superintendent. Officers of Weston & Brooker are: W. S. Weston Jr., president; and Richard Simons, vice-president and general sales manager.

producers probe critical factors in highway program during

4th Annual N.C.L.I. Meeting

By BUREN C. HEROD

ANOTHER ON THE SPOT REPORT

A SUBJECT of paramount interest to every American was the focal point of the fourth annual convention of the National Crushed Limestone Institute. The national highway program—is it big enough? How does it stand now? How do we finance it? What effects will current research have on its development? How involved are pertinent labor relations in any specific area?

These points were prime topics in the two-day session held at the Statler Hotel, Washington, D. C., on January 21 and 22. In addition, N.C.L.I. members joined the National Agricultural Limestone Institute meeting covering operations, and the general luncheon at which W. C. McEachern of the Internal Revenue Service spoke on concepts of depreciation and salvage, since these subjects are pertinent to the interests of both associations.

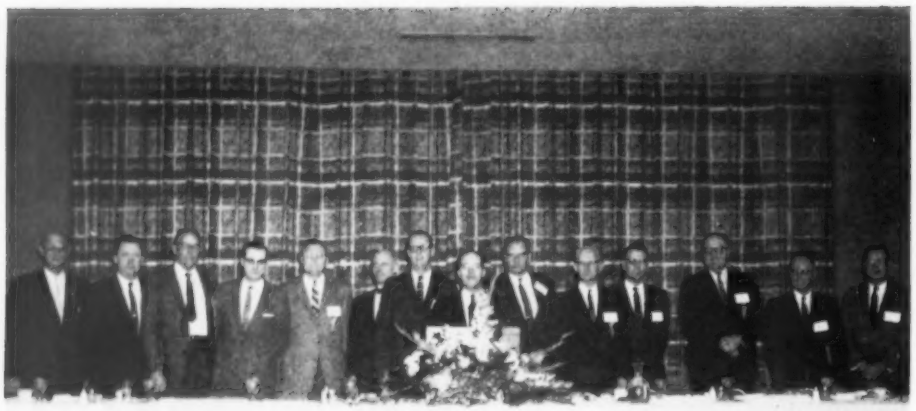
Papers on the factors noted above concerning the national highway program were presented by men eminently qualified to discuss the respective subjects. These speakers included A. C. Leonard, Bureau of Public Roads; Arthur C. Butler, director, National Highway Users Conference; Elmer M. Ward, assistant director, Highway Research Board (National Research Council); James Beaird, assistant to the solicitor, U. S. Department of Labor; and Dr. Robinson Newcomb, Robinson Newcomb Associates.

The Association's top officers include (l. to r.): Taisto Laine (Limestone Aggregates, Inc.), secretary-treasurer; Paul W. Seitz (May Sand & Gravel Corp.), retiring president; E. B. Snead (Texas Crushed Stone Co.), newly-elected first vice-president; Thomas E. Lalley (Bradford Hills Quarry, Inc.), incoming president; and Robert M. Koch, executive vice-president.

New Officers Thomas E. Lalley (Bradford Hills Quarry) was elected to succeed Paul W. Seitz (May Sand & Gravel Corp.) to the N.C.L.I. presidency, and E. B. Snead (Texas Crushed Stone Co.) follows Mr. Lalley in the post of first vice-president. Robert M. Koch continues as executive vice-president, and Taisto Lane (Limestone Aggregates, Inc.) again assumes the duties of secretary-treasurer. H. C. Wolfe (Wyandot Dolomite, Inc.) was newly elected to the executive committee.

Aspects of the Highway Program Appropriately, a film on power shovel productivity produced by the Bureau of Public Roads, which concerned an operating phase of basic interest to every producer-member of N.C.L.I., was shown at the opening of the session on the highway program.

With a dipper of any given capacity, the Bureau's study illustrated in the film shows, there are three



At the head table for the general convention luncheon were (l. to r.): H. C. Wolfe (Wyandot Dolomite, Inc.) and Arnold W. Mulzer (Mulzer Brothers), directors; E. B. Snead (Texas Crushed Stone Co.), first vice-president; J. R. Beaird, U. S. Department of Labor; Paul W. Seitz (May Sand & Gravel Corp.), retiring president; Dr. Robinson Newcomb, featured luncheon speaker; Thomas E. Lalley (Bradford Hills Quarry, Inc.), new N.C.L.I. president; Robert M. Koch, executive vice-president; Arthur C. Butler, director of National Highway Users Conference; J. B. Mount (Maymead Lime Company), director; E. M. Ward, National Research Council; R. E. Meshberger (Meshberger Stone Co., Inc.), director; A. C. Leonard, Bureau of Public Roads; and T. Laine (Limestone Aggregates, Inc.), secretary-treasurer.

primary factors affecting shovel productivity: the time of load-swing-dump-return cycles, how full the dipper is loaded, and delays.

It was found that the shovel operator is the key to the first two factors. However, fragmentation is largely influencing. A study of 10 excavators (all 2-cu. yd.) showed a complete cycle averaging between 17 and 35 seconds. The swing angle proved to be an important consideration, although there was variation in operating speeds.

Minor delays ranging from 11 to 32 seconds were primarily due to waiting for haulage units. Another important item in cutting down delays involving trucks is the matter of establishing sufficient maneuvering room for these units around the shovel.

1958 was the most productive year recorded in federal-aid highway work, Mr. Leonard pointed out. Approximately $9.2 billion were involved, almost all of which was on activity where contracts had already been awarded and construction was under way. Considerable credit for this encouraging progress is due to the high degree of cooperation between the Bureau and the state highway departments, plus the ability of material suppliers to meet demands.

The interstate program is completely on schedule, and currently, over 3,500 miles are under construction. In the ABC program, more than 60,000 miles have been completed, and more than 16,000 miles are under construction.

The largest individual cost item in this work? Aggregates—which represent one-fourth of the total, as well as the largest fraction of material requirements. About 100,000 tons of aggregates are involved for each $1,000,000 of cost, it was noted.

Fortunately, disparity between states in obligating funds is vanishing, Mr. Leonard stated. Other favorable factors include the greater availability of engineering and the fact that suppliers are now geared to the program's demands.

The nation's highway users support and recognize the need for the expanded highway program, but they do not feel that they should carry the full burden of related taxes. This point was emphasized by Mr. Butler, who added that the 1956 Highway Revenue Act calls for a study to determine what taxes should be imposed among those using the federal-aid highways "or otherwise deriving benefits from such highways." The study has been delayed and now has become critically pertinent.

An immediate problem noted is the foreseeable deficit in the Highway Trust Fund, in view of the fact that the cost of the Interstate System program has jumped from $27,000,000,000 to $40,000,000,000 in less than three years. According to hundreds of national and state organizations, Mr. Butler stated, an increase in gasoline tax or other federal automotive excise taxes is not the answer.

Apparently, one solution may lie in suspending temporarily the pay-as-you-go amendment, the speaker pointed out, in order that the trust fund can obtain an advance from the general fund to take care of existing authorizations. If the national debt picture shows such advances to be fiscally unsound, consideration should be given to some form of borrowing, such as the issuance of bonds with the trust fund as collateral, Mr. Butler stated.

Development of facts and figures influencing highway programs and future policies is an important role played by the Highway Research Board. An interesting summary of the organization and functions of the group was made by Mr. Ward.

On a phase critical to the road-building program, the speaker detailed significant experiments in construction and the study of test road areas in Maryland, Idaho, Illinois, and Mississippi. At Ottawa, Ill., for example, the AASHO group has built 836 test sections of pavement with varying thicknesses, different types of base, surfaced by either portland cement or asphaltic concretes, etc. Test traffic has been

Among the guests for the Congressional Banquet was Senator Thruston B. Morton (R., Ky.) second from left, seen here with Robert M. Koch, and Mrs. S. D. Pace (Burkesville, Ky.), and R. S. Waters (Waters Construction Co.), directors.

maintained constantly since last October, and is scheduled to continue for a total of two years.

Data collected will be analyzed by high-speed computers to determine the effect of different axle loads and their relationships to various pavement types on specific subbases.

Interpretation and applications of the Davis-Bacon Act as they apply to the highway program and firms contractually or otherwise related to that activity were described by Mr. Beaird.

Under this act, for the protection of both labor and contractors, the Secretary of Commerce is directed to assure labor and mechanics engaged on federal construction programs at least the minimum wage rate prevailing in the area. (Bookkeepers, clerks, supervisors, etc., are not covered.)

Apparently, a basic test in applying the provisions of the act is whether the man actually performs physical labor and whether he is employed by either the prime contractor or a subcontractor having a contractual relationship to the project. It has been interpreted, for example, that a pit or quarry operator who opens a pit on the site and furnishes material exclusively therefrom to a prime contractor is a subcontractor who comes under the provisions of the act. A similar interpretation has been made in the case of a pit remote to the construction from which the material had an exclusive consignment to a prime contractor.

The decisions cited above seem to be based on whether the men (labor or mechanics) and material of an aggregate producer-supplier are involved solely in servicing a prime contractor engaged in Federal-Aid highway, housing, civil defense, or other governmental construction.

Big—but not big enough. That was the provoking premise brought out by Dr. Robinson Newcomb in a luncheon address concerning the highway program. Why must it be big? Because (in constant dollars) the overall economy has grown consistently at the rate of 3½ percent per year despite depressions or recessions; and to keep pace, traffic must grow at an even faster rate. *i.e.*, at least 4 to 5 percent per year.

Again, why? Because individual communities and their residents are not sufficient unto themselves and must depend upon exchange of goods with comparable groups for existence. Ergo, highways—which have proven to be the most efficient route for transport of most goods—comprise most of the circulatory system carrying the "lifeblood" of modern society.

As to the statement that the current program is not big enough. Dr. Newcomb detailed pertinent historical information. During the 1920's, he stated, and even during the early part of the depression, traffic grew at a rate faster than that of business. However, by the mid-thirties, highway traffic did not follow the traditional growth pattern; it started a sharp drop.

Highway construction expenditures slid from 2 cents per vehicle-mile to 3/10 of a cent, as of 1945. Even now, at about 0.7 cent, the expenditures are below the 1933 level.

This pinpoints the fact that overall public growth has been overlooked. If our economy is to be allowed to grow, we will need even more roads than are presently contemplated to carry more goods.

Other Business The excellent calibre of this convention was cited by the retiring president, Mr. Seitz, as reflecting considerable credit on the executive vice-president, Robert M. Koch, and his staff.

As stated by the new president, Thomas E. Lalley, who has capably headed the group's committee on specifications, the members of the

(*Continued on page* 115)

Dr. Robinson Newcomb, standing, delivered a highly significant discourse on historical background of highway construction, and the nation's future needs. Mr. Butler, right, offered an equally penetrating study of the Federal-Aid Highway Program financing.

14th N.A.L.I. Convention

A Hard-hitting

Group stands solidly on record, policy determination in conservation controversy

SPARKED by certain unsubstantiated criticisms from some quarters, the discussions of industry problems and interests during the recent annual meeting of the National Agricultural Limestone Institute reached new peaks of informative and spirited member participation. Whether concerning such basic factors as individual operating and promotion, or more general considerations such as tax legislation and the industry's relationship to lively developments in the current conservation picture, every session recorded the vigorous interest of those attending.

This 14th convention, held on January 20 and 21 at the Statler Hotel, Washington, D. C., had a recorded advance registration of more than 500 for the sessions and the outstanding annual Congressional Banquet. The latter event was also attended by many members of the National Crushed Limestone Institute. In accordance with the desire of the membership as expressed last year, the recent convention was streamlined with respect both to preliminary meetings of the executive committee and the board of directors meetings—held on January 19—and the traditional sessions on promotion and the Agricultural Conservation Program, which were advantageously combined for this convention.

Highlights of the meeting, which was attention-holding in its entirety, included detailed studies and reports of developments of certain quarrying phases during the operating session, an effective interchange of ideas on promotion and agricultural liming practices in the promotion-ACP meeting, and a penetrating review of current controversy in the national conservation programs, by Robert M. Koch, N.A.L.I. president. In addition, the group was privileged to hear for the first time a discussion of specific tax policies, presented by a member of the Internal Revenue Service and a member of a private accounting and legal organization.

N.A.L.I. has grown both in

(Left to right) Powell G. Potts (Southern Stone Co.), director; Russell W. Hunt (Southwest Lime Co.), director and past-chairman; George A. Ziegler (M. J. Grove Lime Co.), director; E. B. Snead (Texas Crushed Stone Co.), regional vice-president; and Robert M. Bridges (Consumers Co. Division, Vulcan Materials Co.), regional vice-president. Comments of Mr. Bridges as presiding officer for a general luncheon were unanimously regarded as one of the highlights of the convention.

Streamlined Session

By BUREN C. HEROD

W. L. Bryan (Bryan Rock Products, Inc.), right, chairman-elect of the board, is congratulated by W. E. Stone, left, retiring chairman, and Arthur A. Alvis (Alvis Limestone & Concrete Products, Inc.), vice-chairman-elect of the board.

membership and in service rendered during the last year, Mr. Koch pointed out. Active member companies now total more than 440, and this membership is being more efficiently served through an expanded Washington association staff.

With respect to the conservation controversies which have resulted in a few unfavorable comments directed toward N.A.L.I., Mr. Koch reaffirmed N.A.L.I.'s position of having long been on the record as recognizing the good work done by and under the Soil Conservation Service. However, strong exception is taken to specific objectionable practices, including inroads made on ACP funds for purposes which apparently do not always culminate in actual conservation accomplishments.

A single administrative echelon was suggested as a major step toward consolidating the most efficient conservation programs in the best interests of the country as a whole.

Two potentially favorable results of the controversy were pinpointed—(1) the situation is being brought to the attention of a substantially greater number of people in the Administration: and (2) it has led to the formation by Secretary Benson (Agriculture) of an impartial 5-man study group to review SCS and ACP in terms of the most beneficial practices, the funds needed, areas in which the appropriations have actually been expended, conservation actually obtained, etc.

Prospects are excellent for a good conservation program, Mr. Koch stated; and it seems that there is no apparent opposition on Capitol Hill toward maintaining ACP appropriations at least at their current level. In view of inflationary and other factors, it is felt that appropriations should be increased to get the job done; and adding impetus to a real conservation program for the benefit of future generations, as well as the present, would be a credit to this industry.

Photographed during the Congressional Banquet reception, this group includes: C. A. Broecker (Ayrshire Collieries); R. S. Waters (Waters Construction Co.), director; Senator Estes Kefauver (D., Tenn.); R. B. McNab (American Limestone Co.), regional vice-president; and W. Camp Turner (Chattanooga Rock Products Division, Vulcan Materials Co.).

1959 Officers W. L. Bryan (Bryan Rock Products, Inc.) was nominated and elected chairman of the board for 1959. Arthur R. Alvis (Alvis Lime-

Robert M. Koch, N.A.L.I. president; Paul J. Andrew (Melvin Stone Co.), director; John M. Deely (Lee Lime Corporation), past-president; Arthur R. Alvis (Alvis Limestone & Concrete Products), vice-chairman-elect; and Lowell Glendening (Mulzer Brothers), who made the promotion-ACP discussion singularly interesting.

stone and Concrete Products, Inc.) succeeds Mr. Byran in the office of vice-chairman. The combined office of secretary-treasurer is again held by J. B. Mount (Maymead Lime Company). Robert M. Koch, president, and Samuel Omasta, vice-president, continue in their respective offices.

Two vacancies on the executive committee were filled by the election of R. O. Bemis (Basic Dolomite, Agricultural Division of Basic, Incorporated) and George A. Ziegler (M. J. Grove Lime Company). P. K. Alvord (E. I. DuPont de Nemours & Co.) is the newly-elected representative of the Manufacturers' Division on the board of directors.

Coming Meetings Chicago will again be the site of the 1959 mid-year board meeting that has been scheduled for June 8 and 9 at the Sheraton-Blackstone Hotel. The 15th annual convention will return to the Hotel Statler, Washington, D. C., and will be held January 18 to 20, 1960.

Session Opening Under the direction of the retiring chairman of the board, William E. Stone, the first meeting saw many of the activities and problems of the association keynoted in various committee reports. Among the proposals of the legislative, public relations, and tax committee, as reported by Powell G. Potts, chairman, was the suggestion that the Association investigate the potential of depletion tax adjustments designed to curb inflationary trends.

Arthur R. Alvis, chairman of the membership committee, commended the Association staff for field work and related efforts that have resulted in a growth to a new high of 528 active and associate members, as of the end of 1958. In the field of promotion and education, George A. Ziegler, reporting for that committee, stated that various promotional materials now available should not only be continued, but that full use of these items by the members should be strongly encouraged. Robert M. Bridges (Consumers Co. Division, Vulcan Materials), regional vice-president, reported that the regional committees had approved present N.A.L.I. activities and policies and recommended their continuance.

Special Committees Two special groups were established for consideration of priority projects. One of these will be engaged in studying a possible closer alliance between N.A.L.I. and the N.C.L.I. group.

The other, comprised of Robert M. Patton (Davon, Inc.), John M. Deely (Lee Lime Corporation), W. L. Bryan (Bryan Rock Products, Inc.), William E. Stone, and Robert M. Koch, have virtually completed the preparation of an N.A.L.I. policy statement designed to illustrate the group's position and concern with national conservation, as well as to offset previous misrepresentations of N.A.L.I. objectives in some sections of the daily and farm press.

In effect, the policy statement will indicate N.A.L.I.'s strong approval of the ideals of the conservation program established by Congress; it will emphasize its willingness to cooperate with the basic principles of SCS-SCD conservation measures, and with all other formal or government organizations whose primary concern, as with N.A.L.I., is in the furtherance of actual conservation; and it will carry a recommendation for consolidation, where practical, of administrative elements in conservation programs.

Depletion A review of this tax element by John T. Sapienza (Covington & Burling) brought out the fact that the Treasury Department has already recommended to Congress a cut-back in depletion allowances for the cement and clay industries, and that several other nonmetallic industries have been taken under study along these same lines.

Citing several court cases, Mr. Sapienza noted that thus far industry taxpayers have been generally successful in countering Internal Revenue Service adjustments based on end-use and ordinary treatment processes in preparing a marketable product. In most instances, producers have been allowed pulverization and heat treatment, while decisions on bagging have gone both ways.

ACP and Promotion The failure to "glamorize" agricultural limestone was cited by John M. Deely (Lee Lime Corp.) as a possible factor in his firm's lower sales of this material last year. While the weather in his area, as in many others, has been generally unfavorable during critical periods, Mr. Deely refused to take refuge in that factor and stated that the drop was probably due more to a failure to spend the time and effort necessary for good merchandising and promotion. It was

suggested that it is false economy to skimp on funds for stimulating promotion, and that failing to give enough support to state associations in their promotion of aglime is probably a prime factor in the industry's sales problems, nationally.

A significant change in aglime evaluation as now practiced in one state was detailed by A. R. Alvis, Butler, Mo. Despite large producer stocks of liming material (formerly evaluated on $CaCO_3$ equivalent), Missouri officials recently placed in effect an evaluation based on Ca and Mg components, a situation which hit hardest at those producers who have a dolomitic stone.

The factors of $CaCO_3$ actually present in the stone, plus the fineness, are basic to the new evaluation, and as a consequence there can be a substantial variations between one quarry and another in terms of the tonnage required to furnish a given amount of actual calcium. Significantly, it was noted that there have been no field tests to prove the theory of the apparently arbitrary new evaluation.

On another important factor, that of aglime fineness, Lowell Glendening (Mulzer Brothers) delineated developments in Indiana. While 10 years ago ACP specifications called for material with 96 percent passing 4-mesh and 86 percent passing 8, this was recently changed to 80 percent through 8- and 25 percent through 60-mesh.

The picture has been further complicated by a state college proposal that specifications be raised to call for 40 percent through 60-mesh—this despite the fact, according to Mr. Glendening, that the state has had no field tests that prove the merit of such a proposal. Further, there is investigative support for the value of limestone ground no finer than 10- or 8-mesh, and in addition, Indiana farmers themselves have never agitated for aglime finer than that called for in the original specifications.

More and better research on the actual action of aglime in the soil and its potential benefits was described as basic to clearing the air on this problem.

The benefit of purchase orders in a specific marketing area was pointed out by Paul J. Andrew (The Melvin Stone Co.), who indicated that many farmers in the area served by his plant have requested purchase orders, and the use of aglime has grown proportionately with increasing demand for these forms.

Executive committee members present included (l. to r.), top row: W. L. Bryan (Bryan Rock Products, Inc.); Robert M. Bridges (Consumers Co. Division, Vulcan Materials); A. W. Mulzer (Mulzer Brothers); E. B. Snead (Texas Crushed Stone Co.); and Arthur R. Alvis (Alvis Limestone & Concrete Products, Inc.). Front row: Robert M. Koch, president; Russell W. Hunt (Southwest Lime Co.); W. J. Clark (Munnsville Limestone Corporation); William E. Stone, retiring chairman; J. B. Mount (Maymead Lime Co.), secretary-treasurer; and Powell G. Potts (Southern Stone Co., Inc.).

N.A.L.I.'s own promotional materials and services were detailed by Samuel Omasta, who noted that comments heard in the field ascribe decreases in aglime sales to insufficient promotion. He reported that N.A.L.I. is both a medium of promotion and a storehouse of data and on aglime. Available materials include 25 different circulars, advertising and promotion items such as soil sample bags, and other aids.

Basically, it was stated, farmers are not told often enough about the advantages of liming practices. Supporting this proposition is the fact that the drop in aglime sales is paralleled by the use of fewer promotion circulars.

Operating Session A comprehensive review of ground storage reclaiming systems by W. B. Hicks (Hewitt-Robins Incorporated), and a discussion of a piece of equipment considered revolutionary in its applications to quarrying formed the core of the operating meeting.

Limiting his discussion to ground storage (exclusive of loading out facilities) and reclaiming systems involving conveyors, Mr. Hicks pinpointed the three main categories —product storage, feed (or surge) storage, and reclaiming.

The former is probably the most widespread in terms of existing installations and has the most variations in its application. Included in this variation are fixed conveyors from central bins, single and multiple boom stackers suspended from screening structures, radial stackers supplied from collecting conveyors, tripper and shuttle conveyors over stockpiling areas, etc.

Not too much variation is found in feed or surge storage systems, Mr. Hicks pointed out, since these consist essentially of a conveyor to get the material into storage and another to get it out. However, variation is found with respect to capacity, height, and design, due to specific requirements and whether the system is involved with primary feed or to some special section of a plant.

Among several installations illustrated by slides were two involving a boom conveyor that is raised or lowered in accordance with pile height, and a telescopic chute arrangement. Both systems aided in minimizing dust and breakage.

With respect to reclaiming, this process applies to both of the foregoing categories, the main difference between product and feed storage being that the latter usually involves larger material and also feeding

equipment for control of flow into the plant. Illustrations were shown of various systems with and without feeders, with gates, under single or multiple piles, dual reclaiming lines, etc. It was pointed out that it is desirable in tunnel installations to have conveyor decking between the top and bottom belt lines. Further, the use of light-gauge small-diameter pipe for tunnels would involve a relatively low first cost, but would create difficulty in servicing and maintenance.

Addition of ground storage systems to existing plants will obviously vary widely in cost for various operations. However, a rough approximation for a system involving three fixed 18-in. stackers about 100 ft. long at bin height is $16,000 (including foundations and erection). A few thousand more would be required for a system that involved a 24-in. by 100-ft. collecting conveyor from multiple bins that delivered to a 100-ft. radial stacker, for example. The foregoing are represented as approximate costs of rather minimum systems.

In regard to reclaiming tunnel installations, a rough figure for an 84-in. diameter pipe tunnel 50 ft. long housing a 30-in. conveyor for truck loading would be about $150 per ft. erected.

Since very few operators maintain actual costs by operating phases, it is difficult to make comparisons with varying systems. Due to the fact that ground storage reclaiming systems have certain known advantages—for example, a surge system allows one part of an operation to function while another is shut down, and it also provides for a controlled feed—it would seem that many producers not now utilizing such systems would have much to gain by analyzing their costs. Increased efficiencies, control, and lower unit costs would logically soon return the additional investment.

A new concept in mechanical force generation—born of research toward creating a destructive force—has proven to be a potentially revolutionary tool in quarrying. Robert M. Patton (Davon, Inc.), N.A.L.I. director, who has witnessed actual operations of a pilot unit, introduced the inventor and designer, Theodore Ongaro (International Research and Development Corporation), who detailed some of the scientific principles and theory in the background of this development.

In effect, the machine employs a hydraulic pumping system to actuate a force generator that imparts a high frequency vibration to a pointed, cylindrical hammer. The effect of this generation is a blow with a magnitude of 90 tons 20 times per second, in an existing full-size unit.

Used in its first tests as a rock-shattering tool, the machine is placed over the material to be broken with only the point of the hammer—which alone is in contact—touching the material to be broken. Within three seconds of actuation, 18-in. thick slabs of stone (regardless of length or breadth) have been reduced to fragments through the high frequency vibration imparted.

This machine, considered presently by Mr. Ongaro as an accessory to existing loading equipment such as shovels, can be driven by the motor in those units through a power-take-off. It may be used from a shovel dipper stick, a separate suspension arrangement on a shovel, *via* front-end loader arms on a tractor, etc., and may be actuated through various angles by up-and-down and tilting levers.

According to Mr. Patton, the unit has already proven its potential benefits to quarrying in terms of utility equipment savings, less waiting time in loading out, etc.

Depreciation A singular departure from frequent convention practice was made during a general convention luncheon presided over by W. L. Bryan (Bryan Rock Products Inc.) vice-chairman of the N.A.L.I. board. The Association had invited a career-employee representative of the Internal Revenue Service to speak on certain factors in federal taxation.

Webster C. McEachern (chief, Public Utilities Section, Engineering and Valuation Branch, I.R.S.) discussed *The Present Concept of Depreciation and Salvage*. As a matter of significant interest, Mr. McEachern is one of the first members of the engineering and valuation branch (all of whom have engineering or technical backgrounds in industry) invited to speak before industrial groups who are vitally concerned with the critically technical aspects of depreciation and depletion.

Noting that depreciation is the largest single deduction claimed (total dollars) annually, Mr. McEachern pointed out that this amounted to $20,000,000,000 in 1956 (latest year of statistical compilation). The 1954 code provided three specific methods (or any other consistent approach) of depreciation that would, over a given number of years, comprehend a consistent deduction which, plus reasonable salvage, returns cost of depreciable equipment.

The taxpayer's experience was indicated to be a primary factor in determining the useful life of specific equipment for depreciation computation. With respect to Bulletin F—frequently a subject of controversial discussion—Mr. McEachern indicated that this bulletin is based on averages from a great number of operations, but is intended to be a guide. A committee established by the Commissioner of Internal Revenue recently completed a study of Bulletin F rates, and has presented recommendations for revision that are now under consideration by the service.

Salvage, it was pointed out, is *not* defined as scrap value, but is actually often the second-hand resale value, and estimated salvage is best determined at acquisition. Along with the three basic methods of computing depreciation under the 1954 Code, there are three directly related methods of establishing salvage value. In Mr. McEachern's opinion, if salvage is not a major factor in considering equipment depreciation, a deduction computed on the sum-of-the-years-digits is perhaps more advantageous; if salvage is a prime factor, the declining-balance method is perhaps best.

In a pertinent comment on general depreciation, Mr. McEachern stated that many taxpayers are apparently of the opinion that Revenue Ruling 90 indicates that there will be no adjustment to deductions as formulated per returns. However, our federal taxing bodies,

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Wet Grinding of Cement Raw Materials

By J. RICHARD TONRY

Part II

Wash Mill Operation

Clay is dumped on an apron conveyor and fed into the wash mill, as needed, by the operator. Water is regulated according to tests on the clay slip being pumped to storage. When the clay builds up in the center of the wash mill, the operator stops the mill to allow the hanging rakes to move in toward the center and thus sweep out the accumulation. Then he starts the mill, and the rakes swing out from the center.

Control tests for water are made by weighing a test bottle full of clay slip, holding approximately to 60 percent water.

Hard material which does not break up in the mill sinks to the bottom and is dumped into a track-mounted hopper and hauled to waste by trucks.

Thickener Operation

Feed is sent to the thickeners continuously, consistent with mill operation. This practice is the result of experience in trying both intermittent feeding and continuous feeding. It was thought that by feeding at intervals the slurry would settle better, but it was found that continuous settling is necessary for good operation. Several years ago each thickener was fed for eight hours at a time alternately. This practice put the entire mill output into a thickener at one time, while the other thickener was allowed to settle. In this manner, the slurry settled in the free zone, and new feed would have to overtake the slurry level, practically starting a new thickening cycle. Changing from this alternate feeding system to continuous feeding permitted the thickeners to be operated at a higher capacity.

In starting a thickener, a period of 2 to 3 days is necessary to form a thin bed of thickened slurry. Recirculation of the underflow is started soon after operation begins to avoid a heavy layer in the bottom. Underflow can be pumped from one thickener to another.

Withdrawal is continuous from the thickeners at as low a rate as possible to maintain an adequate slurry supply. When tanks are full, the underflow is recirculated if there is any danger of the slurry becoming too thick. Under normal conditions of withdrawal this may not be required.

In operating with the two thickeners, one is held at about 5 percent above and one about 5 percent below the holding point. This means that one carries a higher percentage of clay, which does not affect the underflow moisture, as compared to the other. The low lime thickener is center-fed and has the conventional raking mechanism without pickets.

Keeping the two thickeners above and below the holding point by the same percentage is done to reduce and equalize the amount of slurry withdrawn from each. For example, if one thickener should only be 1.0 percent above holding point and the other thickener 2 or 3 percent below, the relative amounts pulled from each would be different.

The high lime thickener is fed by a launder and has a rake equipped with pickets. There does not appear to be any difference in underflow moisture from the two thickeners, in spite of composition or other details.

The formation of islands in the thickeners occurs occasionally. Islands are floating formations of slurry which gradually accumulate in the thickener. When an island becomes large, this mass may stall the rake.

Other signs of island formation are an increase in power demand by the drive motor, or an increase in moisture in the underflow which cannot be accounted for in normal operation.

To detect the presence of islands before they become large, a check is made about once a week. This is done by riding on the rake structure and probing with an air lance. When an island is found, the lance is used to break up the formation.

The slurry level in the thickeners is checked frequently to determine when capacity is reached. This is done by lowering a small pipe with an air bulb attached, to a point where the water becomes turbid when air bubbles rise to the surface. A second method is to lower a glass tube slowly at the edge of the thickener until it is assumed or found to be in contact with the slurry, and then to seal it off at the top with the thumb and to withdraw it. Measurement of the liquid in the tube locates the depth to the slurry level.

At Plant 8, a convenient way was found to empty a thickener when trouble with rakes was encountered. This method was based on the use of 6-in. pipes rigged as siphons over the edge of the thickeners.

Table 13 lists the important characteristics of some thickeners in current use. Analysis of this data shows that in one plant the rake speed on a low-lime thickener (clay and limestone) is 40 minutes per revolution, compared to 30 minutes for the high-lime thickener. In addition, the low-lime thickener is center-fed, and the other launder-fed. Another difference is the absence of pickets on the low-lime thickener. Since the plant reports no

Table 13—Thickener Data

	Rake			Feed		Underflow	
Plant	Diameter	Speed*	Pickets	Method	Water Percent	Water	Percent Passing No. 200 Sieve
1	225′	40	No	Center	80-84	35-36	85
1	225′	30	Yes	Launder	80-84	35-36	85
2	200′	60	No	Center	85-90	45	89
3	150′	39	No	Center	50-55	35-36	86-89
8	185′	30	Yes	Center	90	35-37	96

*Speed is given in minutes per revolution of rake.

difference in underflow moisture, it appears that the center feed for the low-lime thickener and the high-lime thickener with pickets give satisfactory results for these materials. The limestone is rather soft (grindability-Wi—7.1 kw.-h/ton) and probably could be slow settling under different operating conditions.

For general information, a particle size analysis of this slurry from the thickeners is shown in Table 14, representing kiln feed as made up from both thickeners.

The thickener being operated with 45 percent moisture in the underflow (Plant 2) is not making slurry for kiln feed, but for filtration and further processing. The raw material is a cement rock.

In a plant (3) using a mix of limestone, shale, iron pyrites cinder, and occasionally sand, no evidence of segration was reported in the underflow under normal raw-grinding conditions. This was attributed partly to flocculation of the slurry. When the operation is irregular, some coarse material appears in the underflow representing the harder fractions of the raw mix.

Several plants reported better settling in summer than in winter in the thickener. This has been demonstrated in the laboratory by cylinder tests at various temperatures.

Thickener Underflow

In Plant 1 normal moisture content of the underflow slurry is 35 to 36 percent, and it has gone to 28-30 percent, although this lower range is too low for desirable flow properties. Plant 3 operates in practically the same range of moisture content.

One thickener (Plant 1) has a sump located at the periphery and connected by pipe to the center outlets. The pump is located at the lower elevation of the sump. Normally no difficulty is encountered with this arrangement while pumping is continuous. However, when the pump is shut off, this pipeline may become plugged.

The other thickener (Plant 1) has no sump for slurry but has the pump located near the center of the thickener, with short pipes to the outlets. This arrangement is considered more desirable by plant officials. Pumping is regulated by means of plug type valves at the thickener. An ammeter in the motor circuit is used as a guide in adjusting the flow of slurry.

The pumps are 4-in. sand pumps driven by 100-hp. motors. They have 6-in. intake and 4-in. discharge connections, and elevate the slurry 108 ft. vertically, and up to 250 ft. horizontally, to the storage tanks. Originally, 60-hp. motors were used, but they were not powerful enough to move the necessary amounts of slurry.

Water and air connections are available on the underflow pipes for loosening slurry when it becomes to thick to pump.

In Plant 1 efforts are made to hold a pH of 8.0 to 8.5 in thickener overflow. The river water generally runs 7.5 to 7.75. When the pH goes to the range of 9.5 to 10.0, settling becomes too rapid in the thickener. Stack dust carried by the wind will increase the pH in the thickeners. (See section on pH on slurry.)

Flocculation

The use of synthetic flocculants has been tried to bring about settling of fine solids. In this process of agglomerating, many fine particles move into clumps so that their effective size is increased many times. Tests of one commercial product being used in a thickener show this action and the rapid settling which takes place in the early stages. This applies especially to initial settling in the region of free fall. Since water is trapped between flocs, the pulp level does not go down to the same point as in an unflocculated slurry.

III—Liquid Cyclones

Cyclones of the cone type have been in use for many years in the mining and metallurgical industries for desliming and classification of tailings. The present type of liquid cyclone has been in use only about ten years. In most of the applications the use of large amounts of water in the feed and overflow was of no particular concern. Generally, the underflow was the desired product, which could be discharged at about 30 percent water.

The liquid cyclone is a true classifier and makes size separations by means of centrifugal force generated in the slurry. The action is similar to that found in dry cyclones where dust is separated from gases. Coarser particles are thrown to the outside walls of the cyclone, passing down into the cone section and out through the apex valve. Fine particles remain in the inner spiral of the vortex and, with most of the water, move upward into the vortex finder and out of the cyclone.

Regulation of the cyclone is accomplished by means of pressure and size of openings, including feed inlet, vortex finder, and apex valve.

Table 14—Thickener Underflow—Screen Tests— Plant 1 (Percent Passing)

Water-		35.7%
Screen-No.	30-	99.99
	40-	99.97
	50-	99.94
	70-	99.66
	100-	98.41
	140-	92.19
	200-	87.06
	325-	77.51
55 Micron	-	74.44
	50-	72.23
	45-	70.68
	40-	68.33
	35-	65.00
	30-	61.49
	25-	57.59
	20-	53.44
	15-	47.86
	10-	40.26
	5-	26.05

Surface area-3952 cm.²/gm.
Rake 12′x18′
Bowl 25′ diam.
Sampled 3/6/56.

Changes in moisture content of the feed also cause variations in products obtained. Discharge from the apex valve may be either "ropy" or "spray." A ropy discharge is thick, and carries less water than average; it is usually rather coarse. This results from a small apex opening and can cause oversize particles to be included in the overflow or fines from the cyclone. Coarse solids build up inside the cone of the cyclone due to restriction of the opening in the apex valve.

The spray type of discharge from the apex is more typical of cement plant operation. An air core will form inside the vortex of the pulp in the cyclone, and there is less tendency for oversize particles to be carried up with the overflow or fines product.

The operating variables of the cyclone have been summarized by one manufacturer* as follows:

1. Pressure drop across cyclone
2. Specific gravity of feed solids
3. Quantity and size distribution of feed solids
4. Plasticity of feed material
5. Size of openings

The individual effects of these variables are of interest in understanding the operation of the cyclone.

1. *Pressure drop across cyclone*—Feed enters the cyclone tangentially under pressure and causes a vortex to form in the slurry. Higher pressures are indicated for thicker slurries and at fine separations. Two plants (11 and 5) using 6-in. cyclones on slurry operate at 40 and 42 to 45 p.s.i., respectively. One plant (12) using a 4½-in. cyclone, operated on a pressure of 75 p.s.i. (experimentally).

In one plant sand is removed from clay with a 12-in. cyclone operating on a normal pressure of 50 p.s.i. Changes in degree of separation of sand are accomplished by varying the pressure of the cyclone feed. This is done by means of a variable speed drive on the slurry pump. This plant is expected to go to smaller cyclones and operate at lower pressures.

2. *Specific gravity of feed solids*—The effect of this variable has not been established in the limited applications on slurry. However, if one constituent of a slurry had an appreciably different specific gravity, compared to the bulk of the materials, some segregation could be possible.

3. *Quantity and size distribution of feed solids*—Tests on cement plant slurry show that separations may be made consistently at 48-mesh even though the feed varies in fineness. This is best shown by typical figures in Table 15, representing test work done at plant 11 (marl-clay slurry). If a slurry is fed to a cyclone at a relatively low fineness, a product essentially all passing 48-mesh will be obtained, but possibly showing a comparatively low No. 200 fineness.

4. *Plasticity of feed material*—Test runs on comparatively viscous slurries, such as those consisting of marl and clay, show that classification is accomplished. However, due to the difficulties of manipulating the water content of the slurry, which is characteristic of such slurries, the tests were discontinued as unsatisfactory. As technology in the use of the cyclone improves, there is a possibility that this slurry could be successfully processed. Inherent shearing action of the cyclone is sufficient to overcome the viscous nature of marl-clay slurry.

In some cases additional water is indicated for satisfactory operation; for such operations dispersing agents may be used. This could mean production of slurry at lower than normal water content and at higher production rates.

5. *Size of openings*—The size of the apex valve opening determines the sizing of the product for uniform conditions of feed and pressure. The smaller the apex open-

Table 15—Cyclone Test Data—Feed and Product Fineness (Plant 11)

Percent Passing	New Feed to Mill	Underflow (Coarse)	Feed	Overflow (Fines)
No. 50	49.7	94.5	98.7	99.96
No. 100	34.3	80.3	94.4	98.5
No. 200	27.7	64.8	84.5	90.2
Tons per hour	14.5	5.6	24.8	19.2
Water (Percent)	45.9	36.1	44.0	45.9

Table 16—Grinding Systems Using Liquid Cyclones

Plant	Raw Materials	Grinding Mills
3	Limestone Clay Sand	Compartment mill
5	Limestone Clay Sand Iron dust	Compartment mill
11	Marl Clay	Tube mill (Second stage)
12	Limestone Shale	Tube mill (Second stage)
13	Sandy clay	Clay beneficiation

Table 17—Liquid Cyclone Data On Slurry

Plant	Date	New Feed P.S.I.	New Feed T.P.H.	New Feed % Water	Fineness* No. 50	Fineness* No. 100	Fineness* No. 200	% C.L.
5	3/31/55	46-52	36.8	34.3	99.41	95.1	84.8	82.5
	6/6/55	....	34.0	40.3	99.98	99.15	92.4	77.0
	6/17/56	36	34.2	38.4	99.72	93.9	83.5	119.0
3	.....	....	27	36	....	...	86-89	....
11	8/5/53	40	15.8	43.9	99.95	98.0	89.0	22.9
12	1954	75	21.3	41.8	....	98.8	88.7	81.3

*Percent passing
Plants 3, 5, 11 used 6-in. cyclones; 12 used a 4½-in. home-made liquid cyclone.

Table 18—Cyclone Data

Plant	Size	Apex Valve	Vortex Finder	Feed Opening	Percent Water	Production* Increase (%)
3	6"	1½" diam.	2½" diam.	1.23 in.²	36	50
5	6"	2" diam.	2½" diam.	.....	35-40	25
11	6"	2" diam.	2½" diam.	1.5 in.²	46	10 to 16
12	4½"	¾" diam.	1½" diam.	0.875 in.²	34-38	20 to 30

*Compared to open-circuit operation.

*Classification in Hydrocyclones — George Darby *Ceramic Bulletin*, Vol. 34, No. 9, 1955.

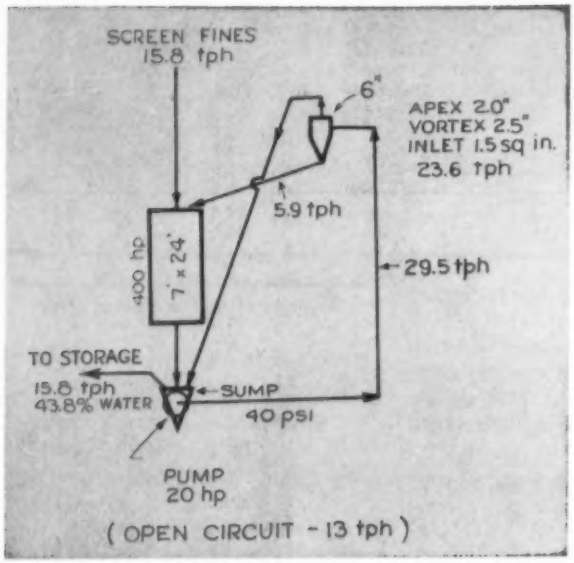


Fig. 3—Flowsheet for experimental cyclone, Plant 11.

ing, the thicker the discharge, until a ropy condition is established. The feed inlet and the vortex finder may be adjusted for refinements of operation.

A critical point in the operation of a liquid cyclone is surging of the feed, both in regard to solids content and volume. Volume of feed is considered most important, and careful design is needed in the pumping circuit. A suggested feed arrangement includes a suitable sump and provision for recirculation of the cyclone overflow. The sump is constructed with a sloping bottom to prevent build-up of coarse particles. A baffle separates cyclone overflow from the mill discharge to permit removal of finished product from the sump and still provide a means of holding a uniform level in the sump. Currently, efforts are being made to use automatic controls for maintaining uniformity of the slurry.

These controls include such equipment as the density controller, which has been tried in one cement plant with successful results in early tests. By measuring radiation through a column of slurry, the water content is controlled to a set value through automatic devices. Other controls of the same type are also being used.

For measuring the pressure in slurry pipelines, a diaphragm gauge is used. This permits use of the Bourdon tube instrument without interference of the slurry. Pressure is transmitted through a suitable diaphragm to an inert fluid which fills the tube. The conventional gauge quickly fails when applied directly to slurry.

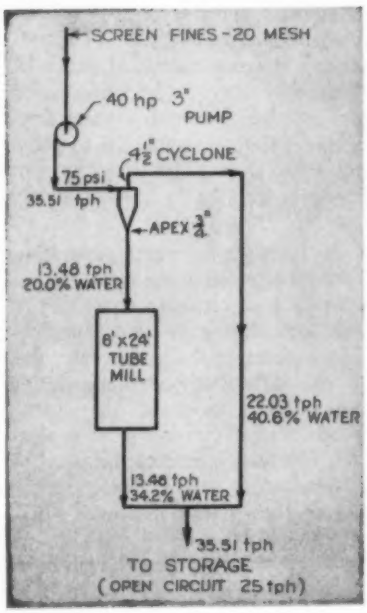


Fig. 4—Flowsheet for experimental cyclone, Plant 12.

Current Usage of Liquid Cyclones

Liquid cyclones are being used or have been tested experimentally in some plants. General characteristics of these installations are shown in Table 16. Two plants use single-stage circuit grinding with compartment mills, two plants use the cyclone in connection with a tube mill in secondary grinding, and one plant removes sand from clay.

Actual test results for liquid cyclones are shown in Table 17, including pressures, production rate, water content, fineness, and circulating load. The data for Plant 11 were obtained on a circuit which was considered too small to supply a 6-in. cyclone properly with feed, which may account for the low circulating load of 22.9 percent. One plant (5) reported that best results indicated a circulating load of 80 percent to be favorable. In Table 18 are listed the details in regard to cyclones, giving opening sizes, range of water content of slurry, etc.

Liquid cyclones have been tried experimentally in two plants (11 and 12) with interesting results. In both, the circuit received slurry from a preliminary grinding system and produced a finished slurry. One plant (11) showed a small increase in production, but the system was abandoned because extra water was required in the slurry, more than was used normally in open-circuit operation. The other plant (12) showed a substantial increase in

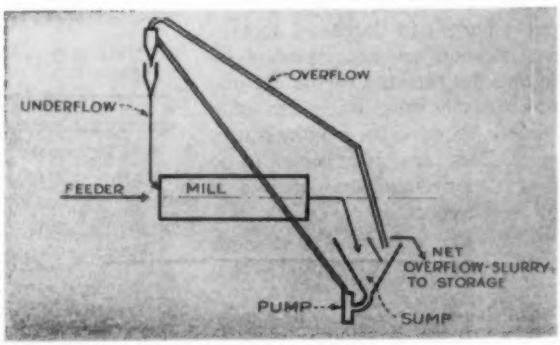


Fig. 5—Arrangement of cyclone in closed circuit with tube mill.

production, going from about 25 t.p.h. in open-circuit to about 35.5 t.p.h. in closed circuit. This latter test run was of comparatively short duration but indicated the possibilities of the circuit. Figure 3 and Figure 4 show the flow diagram for both circuits with applicable data filled in to make the picture more nearly complete.

A comparison of data shows:

	Plant 11	Plant 12
Cyclone Feed—percent passing No. 50	49.7	...
100	34.3	79.7
170	...	69.9
200	27.7	65.2
Cyclone Product—percent passing No. 50	99.9	...
100	98.5	97.7
170	...	91.1
200	90.2	86.2
Circulating load—percent	29	76
Reduction ratio	116	3
Production—t.p.h.	15.8	35.5
Percent water	43.8	40.6
Raw materials	Marl-clay	Limestone-shale

It must be noted that the final slurry from Plant 12 was finer than is shown for the cyclone product, due to the grinding of the cyclone rejects in the tube mill; also, a lower final moisture content than 40.6 percent.

Liquid Cyclone Installation

A diagram of a typical liquid cyclone installation is shown in Figure 5, which shows the essential sump with a return to help maintain a uniform slurry level. A baffle is mounted in the sump to prevent the mixing of finished slurry and mill discharge. Another feature of the installation involves the sloping sides of the sump, which prevent accumulation of coarse material around the pump inlet.

APPENDIX

Comparison of the grinding systems is shown in this table, made up of averaged data for each type.

By calculating the volume of the mills and dividing by the tonnage ground per hour, the expression was obtained for *cu. ft. mill per ton of product per hour*. This clearly separated four systems in use until the large mill entered the picture. As would be expected, the closed-circuit system with rake-and-bowl classifiers leads the list in mill utilization, and the open-circuit system is at the bottom of the list.

The second basis of comparison, *tons of product per ton ball charge per hour*, also reflects the effort of closed-circuit operation. Here again, the rake-and-bowl system leads the list at 1.28, and the open-circuit system is at the bottom, at 0.40.

One set of values has been omitted from the above average since it is too far from general trend (on the low side). This is a closed-circuit system processing shells and sand.

Bestwall Gypsum is planning a multimillion-dollar gypsum board, lath, and plaster plant at the Wilmington Marine Terminal, Wilmington, Del. The proposed plant would employ about 200 production workers and have an annual capacity of over 150,000,000 sq. ft. of gypsum board and lath products.

SUMMARY — OUTPUT OF GRINDING SYSTEMS

(Averaged from various plants)

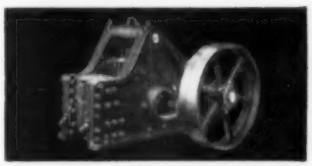
Type System	Cu. Ft. Mill Volume Per Ton Of Product Per Hour	Tons Product Per Hr. Per Ton Ball Charge
Closed-Circuit, Rake and bowl	16	1.28
Closed-Circuit, Liquid cyclone	33	0.63
Large Compartment Mill, Vibrating screen	36	0.48
Two-Stage, Vibrating screen	45	0.51
Open-Circuit	52	0.40

NO MAJOR REPAIRS IN 25 YEARS*

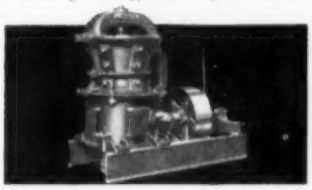
Sturtevant Construction Assures Long Mill Life at Top Loads

Sturtevant crushing and grinding machinery answers the long life top-load production problem for medium to small size plants. Many Sturtevants have been operating above rated capacities for more than 25 years, and *without a major repair*.

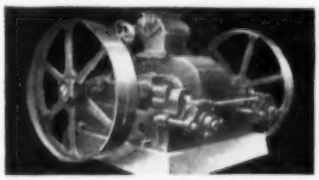
"Open-Door" design gives instant accessibility where needed — makes cleanouts, inspection and maintenance fast and easy. Machines may be set up in units to operate at equal quality and capacity.



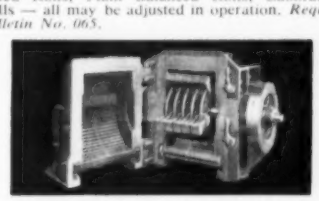
Jaw Crushers — Produce coarse (5 in. largest model) to fine (⅛ in. smallest model). Eight models range from 2 x 6 in. jaw opening (lab model) to 12 x 26 in. Capacities to 30 tph. All except two smallest sizes operate on double cam principle — crush double per energy unit. *Request Bulletin No. 062.*



Rotary Fine Crusher — Reduce soft to medium hard 3 to 8 in. material down to ¼ to 1¼ in. sizes. Capacities up to 30 tph. Smallest model has 6 x 18 in. hopper opening; largest, 10 x 30 in. Non-clogging operation. Single handwheel regulates size. *Request Bulletin No. 063.*



Crushing Rolls — Reduce soft to hard 2 in. and smaller materials to from 12 to 20 mesh with minimum fines. Eight sizes, with rolls from 8 x 5 in. to 38 x 20 in.; rates to 87 tph. Three types — Balanced Rolls; Plain Balanced Rolls; Laboratory Rolls — all may be adjusted in operation. *Request Bulletin No. 065.*



Hammer Mills — Reduce to 20 mesh. Swing-Sledge Mills crush or shred medium hard material up to 70 tph. Hinged-Hammer Pulverizers crush or shred softer material at rates up to 30 tph. Four Swing-Sledge Mills with feed openings from 6 x 5 in. to 20 x 30½ in. Four Hinged-Hammer Pulverizers with feed openings from 12 x 12 in. to 12½ x 24 in. *Request Bulletin No. 084.*

*Reports Manager W. Carleton Merrill concerning Sturtevant Swing-Sledge Mill at James F. Morse Co., Boston.

STURTEVANT
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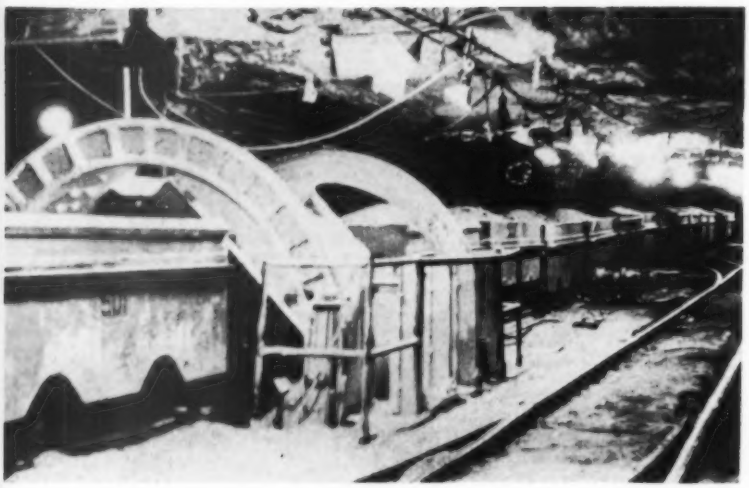
Enter 99 on card, page 139

7½-mile belt conveyor system solves haulage problem for

Potash Company

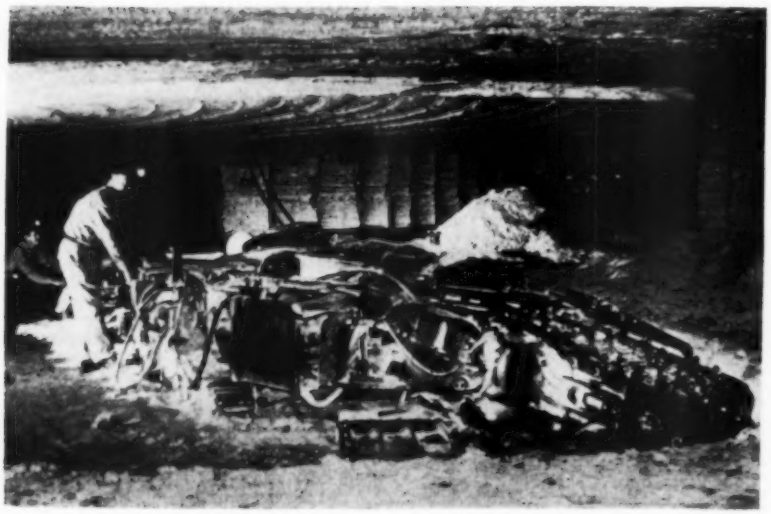
By R. R. KNILL
Mine Superintendent, P.C.A.



At the main ore shaft, 5½-ton mine cars are discharged by a rotary dump.

IN 1930 a small group of Colorado mining men interested in the newly discovered potash fields of southeastern New Mexico held a meeting in Denver. The result of that meeting was the incorporation of the Potash Company of America.

After a number of setbacks and difficulties, the young organization outlined a sylvinite orebody of commercial value near Carlsbad, N.M., and by December, 1933, it had sunk and completed a shaft in the property. The first ore mined by the company was shipped two months later—it had been hand-mucked into 5-ton mine cars, trammed to the shaft by battery



A continuous miner cutting bottom in a development entry at P.C.A.'s operation near Carlsbad, N. M.

# of America

locomotives, and hoisted 1,000 ft. to the surface.

As mining advanced, it appeared that equipment similar to that used in coal mining would be satisfactory in this operation. Accordingly, it was decided to purchase such units as shortwall undercutters and electric coal drills. Since the main shaft was located near the center of the orebody, where the thickness of the bed was between 6 and 9 ft., there was ample clearance at that time for locomotive haulage.

Accelerated ore haulage was soon required as production and distances from the hoisting shaft increased. Standard mining panels were established, and reel-type 250-volt d.-c. trolley locomotives were purchased. Loading machines of various kinds were in use until 1942, when Joy shuttle cars and 11B loaders were acquired.

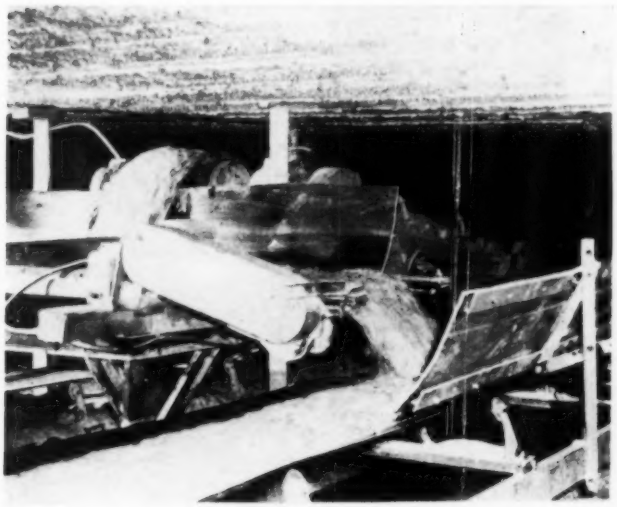
With the latter equipment mining was conducted in panels 2,000 ft. long and 1,500 ft. wide. Rooms driven on 52-ft. centers were 28 ft. wide, and had breakthroughs, also 28 ft. wide, driven off on 90-ft. centers. Ore from the working faces in these extraction panels was hauled by shuttle car to mine cars, which were loaded by elevating conveyors or ramps. Mine cars were hauled, eight at a time, by Westinghouse trolley-battery combination locomotives to gathering points in the main system. From these gathering points, the cars were hauled by the mainline locomotive to the rotary dump at the main ore shaft.

Decreasing ore height accompanying face advance forced a costly operation in grading panel haulageways to permit installation of tracks and trolley. About 6,000 tons of salt waste had to be moved for each of the three track haulageways within the panel.

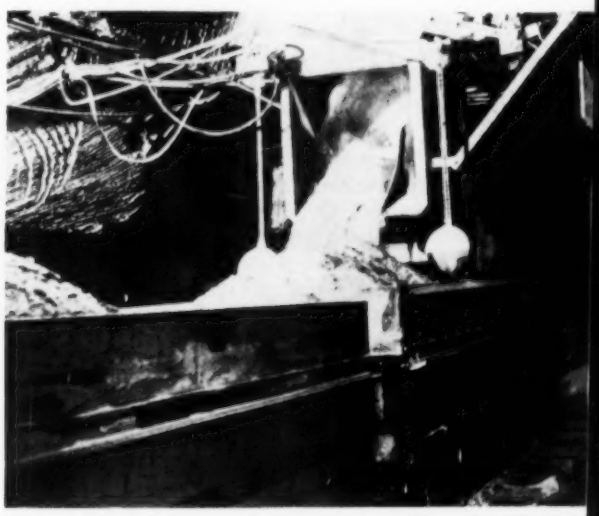
Increasing costs in grading led to further study of haulage methods; and in 1949 the decision was made to substitute belt conveyors for panel truck haulage. Two 36-in. by 750-ft. units were ordered—one from Joy Manufacturing Co., and the other from Goodman Manufacturing Co. Immediately after installation, engineering cost studies were made. Considerable savings were indicated, both in maintenance and operation, in comparison with the previous system, and these conveyors are still in use.

A search for new mining methods was also stimulated by the fact that lower ore heights were being encountered toward the fringes of the main orebody. Management felt that since potash ore can be undercut, it could also be extracted by continuous mining machines. In the latter part of 1947

The 2,500 ft. long panel haulage conveyors (tripper head of shuttle unit shown) are used in conjunction with continuous miners.



An automatic loading station at the head of a 36-in. panel conveyor. Float balls control loading through interlocking switches.



This view toward the underground ore bin shows a 30-in. mainline conveyor installation of 3,500-ft. total length.

engineers were assigned to the development of such a machine suitable for use in potash mining.

Early in 1951 four Joy continuous miners were purchased for development work. It became apparent that continuous mining machines would be satisfactory for this work in potash, but that heavier and more powerful equipment than was then available would be required.

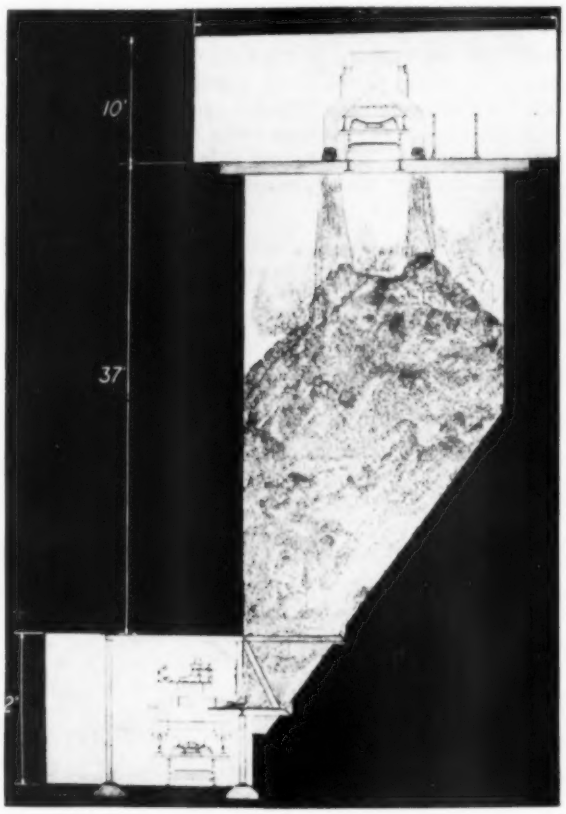
After further research and development, the first four P.C.A. continuous miners were completed in the summer of 1953. All four were assembled underground. As continuous mining progressed, it became evident that complete success of the system could be attained only with continuous haulage, and that belt conveyors would provide the nearest approach to that goal. Company engineers, aided by engineers of Hewitt-Robins, Inc., designed and installed a panel haulage system consisting of 24-in. by 550-ft. Hewitt-Robins Mineaveyors (shuttle conveyors), discharging to 36-in. by 2,500-ft. panel conveyors. The latter discharge into mine cars at automatic loading stations in the main entries.

Earlier loading arrangements were supplanted by the present system, which is comprised of Stamler hydraulic car spotters, and fly gate chutes connected to the heads of the panel conveyors.

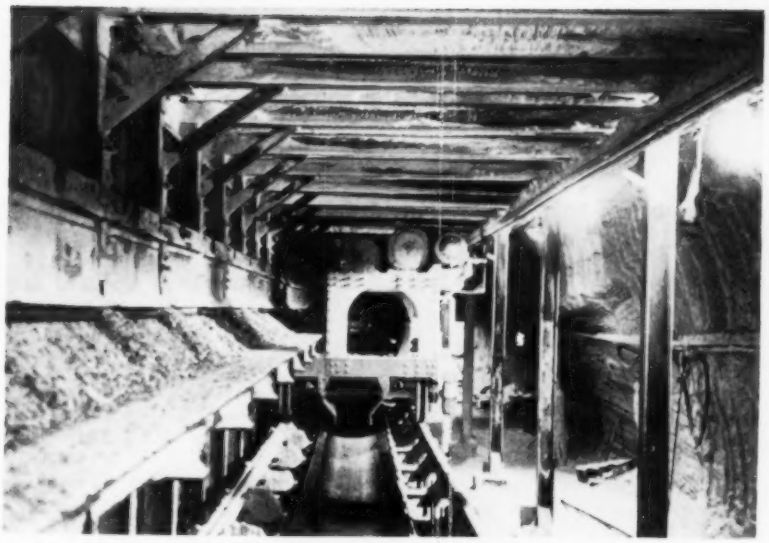
As indicated by drill holes, two more large orebodies, with rather steep dip, lay to the east of the mine. When the decision was made to mine this ore, the steep grades involved and the satisfactory costs experienced with continuous mining and belt conveyor haulage were influencing factors in the decision to utilize the same type of equipment. The latter would include a 23,560-ft. long mainline conveyor with a 30-in. belt. This decision proved quite correct since grades approaching 34 percent over short distances were subsequently encountered.

The larger of the two orebodies was located directly eastward of the hoisting shaft. After about 5,000 ft. of entry had been driven to its edge, the steep grades encountered, prohibitive to rail haulage, indicated the suitability of a mainline belt system.

Tonnage requirements, along with the grades, showed that 30-in. conveyors, equipped with tandem drive and 100-hp. motors, would be satisfactory. Hewitt-Robins Ajax cotton-rayon 4-ply, 42-oz. equivalent belting was acquired in lieu of cotton duck, in view of the high tensions involved in some of the steeply inclined conveyors. Breaker



This cut-away view through the bin area shows the tripper, above, and the plow feeder entry, lower left.



The plow feeder, center, travels at a controlled speed across the bottom of the ore bin. Feed can be varied from about 50 to 450 t.p.h.

strips were not considered necessary since all of the ore to be transported would be from continuous miners, and with the minimum of lumps over 6 in., would present little difficulty with impact.

For ease of installation, specifications called for 13-ft. 6-in. sections to be fabricated from 5-in. channel stringers without deck plates.

The problem of underground ore storage was the next factor for consideration. Only 200 tons of ore could be held in the shaft pocket, which was rapidly emptied by 8½-ton Card bottom-dump ore-skips. Underground storage was apparently the answer; but since sylvinite ore is hygroscopic and readily sets up under damp conditions, designing a suitable bin, in which the material would not hang up, proved difficult.

Several designs were considered and discarded. Finally a narrow bin, 20 ft. wide, 110 ft. long, and 42 ft. high, was selected and designed to be supplied from a 36-in. conveyor and tripper installed lengthwise across the top. To remove the ore from the bin, a Hewitt-Robins traveling rotary plow feeder was installed at the bottom to discharge onto a 36-in. inclined conveyor, which in turn transported the ore to the shaft pocket.

The plow installation followed a study made by P.C.A. engineers of operations in the steel industry, where this equipment has long been in use for handling wet and sticky iron ores. Justification for its use in a potash mine has been found in the fact that only minor difficulties were subsequently experienced with hanging up. Operating and maintenance costs for the bin system have also proven negligible.

A rather novel method of excavating the ore bin stemmed from its close proximity to the shaft, which precluded heavy blasting. The method involved the use of a Joy continuous miner, with which an initial cut was started downward from one end of the projected ore bin area at a slope of about 5 percent.

When the opposite end of the bin area was reached, the miner was pulled back and a cut was started at a steeper downward grade. Muck was removed by a Joy shuttle car, which, after a certain grade had been reached, was assisted out with its load by a tugger mounted at the top of the cut.

When an 18 percent grade had been reached, the equipment was removed and used to start a decline from a point near the shaft to the plow feeder level. About halfway down this offset decline, the miner as turned off to intersect the center of the prior excavation. When the intersection had been made, it was possible to mine out the entire bin by alternating downward cuts to the bottom of the plow feeder level. Mining, steel work, and equipment installation were all carried out by P.C.A. crews under the supervision of company engineers.

Since its initial operations in the early summer of 1955, this ore bin and mainline conveyor system have handled and transported over 2,500,000 tons of ore from the continuous mining operations. The decision to use conveyor belt systems as described here has been amply justified by gains in efficiency, lower haulage costs, and decreased hoisting delays—all important to Potash Company of America in maintaining its position in the highly competitive potash industry.

A.G.C. Manual on Blasting Provides Handy Log Book

Publication of the first uniform record book for blasting operations in construction has been announced by The Associated General Contractors of America.

Blasting Log provides contractors with a permanent record of each blasting operation. In the event of claims resulting from blasts, the contractor can use the log as a reference in connection with any seismographic records that may be available.

Copies can be obtained by writing to A.G.C. national headquarters, 1957 E Street, N. W., Washington 6, D. C. Price, 20 cents per copy; $2.25 per dozen copies; $15 per hundred copies.

Natl. Highway Contracts For Dec. Total $167 Million

Construction contracts of 274 miles of the National System of Interstate and Defense Highways, including 221 bridges, were awarded during the month of December at an estimated cost of $167 million.

Figures from the Bureau of Public Roads, U. S. Department of Commerce, showed that preliminary engineering worth $14,000,000 and right-of-way acquisition estimated to cost $39 million were authorized during the month. Construction contracts were completed in December on 364 miles, including 251 bridges, at a cost of $147,000,00.

JAMES B. MCCORKLE of Evanston, Ill., has been named director of gypsum rock sales for the United States Gypsum Company.

industry's vigor reflected in

1959 Annual N.C.S.A.

THE recent 42nd annual convention of the National Crushed Stone Association at Miami Beach, Fla., January 27 to 30, 1959, fulfilled to a high degree the objectives actually and popularly ascribed to such meetings. The location, at the plush Americana Hotel and the Bal Harbour Group, left nothing to be desired, as far as recreational facilities, comfort, and weather are concerned. The meetings measured well up to previous standards in the importance of the subjects discussed and in their variety. As a result, the attendance of over 1,000 broke the previous record for a non-show year set here two years ago.

The session for salesmen was especially important to many producers who have paid more attention to operating problems than to those connected with sales. Excellent papers outlined technical service to sales; sales promotion; co-ordination of sales with credit, price, and collection policies, and with sales and production. Each topic evoked spirited discussion.

As usual, operating information was prominently featured, with two morning sessions devoted exclusively to that subject. Other subjects included record keeping for efficiency, increasing plant capacity,

The serious side . . . .

One of the several discussion groups convened during the round table session. The latter was an enthusiastically received innovation in N.C.S.A. convention proceedings.

Convention

business meetings, entertainment, locale set standard for future sessions

and the various phases involved in the use of ammonium nitrate explosives. A new and popular feature was the concurrent informal group of operating discussions which was given an entire session. Separate tables with discussion leaders were devoted to 11 different major operating phases, such as drilling and blasting, primary crushing and surge piles, stockpiling, etc.

Other subjects were as follows: safety, the new N.C.S.A. *Accounting Manual*, pension and profit-sharing plans, federal laws and legislation, and engineering problems.

Presiding officers for the eight convention sessions were the following members: Oscar E. Benson (General Crushed Stone Company, Easton, Pa.) N.C.S.A. president; Clarence Camp II (Camp Concrete Rock Company, Ocala, Fla.); Arthur Goff (Wallace Stone Company, Bay Port, Mich.); T. W. Jones (New Haven Trap Rock Company, New Haven, Conn.); V. G. Aubry Jr. (Houdaille Construction Materials, Morristown, N. J.); John F. Lane (Gall, Lane and Howe, Washington, D. C.); W. C. Rowe (Rowe Contracting Company, Malden, Mass.), then vice-president and now president of N.C.S.A.

New Officers Warren C. Rowe (Rowe Contracting Co.) heads N.C.S.A. in 1959. The announcement of Mr. Rowe as suc-

. . . . was leavened with fun

The Hawaiian Luau was one of the most colorful social events in the history of the association's meetings. Approximately 1,000 members, wives, and guests enjoyed this evening of fun and relaxation.

Big names in N.C.S.A.: W. C. Rowe (Rowe Contracting Co.), newly elected president; N. E. Kelb (Cumberland Quarries), past-president; O. E. Benson (General Crushed Stone Co.), retiring president; and J. R. Callanan (Callanan Road Improvement Co.), re-elected treasurer.

cessor to the retiring president, O. E. Benson (General Crushed Stone Co.), was made during the greeting luncheon along with the names of other new association officers. George D. Lott Jr. (Palmetto Quarries Co.), succeeds Mr. Rowe as vice-president, and the re-elected treasurer is J. Reid Callanan (Callanan Road Improvement Co.). J. R. Boyd, executive director of N.C.S.A., was re-elected secretary.

New members of the executive committee include N. E. Kelb (Cumberland Quarries, Inc.), Charles Coburn (Waukesha Lime & Stone Co.), W. P. Foss (New York Trap Rock Corp.), R. S. Reigeluth (New Haven Trap Rock Co.), Nelson Severinghaus (Consolidated Quarries Corp.), and D. L. Williams (Virginian Limestone Corp.).

Future Meetings The 1960 annual convention and machinery exposition will be held as scheduled at the Conrad Hilton Hotel, Chicago, the week of February 21. The 1961 convention, originally scheduled for New York City, will again be held at the Americana Hotel, Miami Beach, Fla., January 24 to 26, the week following the N.S.G.A. convention there. The 1962 convention and exposition will also be at the Conrad Hilton Hotel, Chicago.

The 1959 meeting of the board of directors will be held on July 8 at The Homestead, Hot Springs, Va.

Safety Winners Another feature of the greeting luncheon was the presentation of awards to winners of the 1957 N.C.S.A. safety contest by H. H. Kirwin (Eastern Rock Products), chairman of the association's accident prevention committee.

Top honors among the 45 member companies who established no lost-time accident records went to the Clinton Point Quarry of the New York Trap Rock Corp., which was operated 374,800 man-hours for the peak safety record. George White, superintendent, accepted the impressive bronze plaque, contributed by *Explosives Engineer Magazine*, for his crew.

Honorable mention and N.C.S.A. certificates were presented to the other 44 contest winners, whose names appear on a poster shown in an accompanying photograph. Significantly, more than 1,300 men are employed by these plants. This latest in a series of annual contests conducted since 1926 under the auspices of the Bureau of Mines, involved 13 more plants with no lost-time records than in the previous year.

Manufacturers' Division W. E. Collins, Jr. (Atlas Powder Co.), succeeds L. A. Eiben (Northern Blower Co.) to the chairmanship of the Manufacturers' Division. Elected to the office of vice-chairman was George Fraunfelder (Easton Car & Construction Co.), while Fred A. Pampel (Chain Belt Co.) and J. M. Hume (Pettibone Mulliken Corp.) were named to the executive committee. J. R. Boyd, executive director of N.C.S.A., retains the duties of secretary.

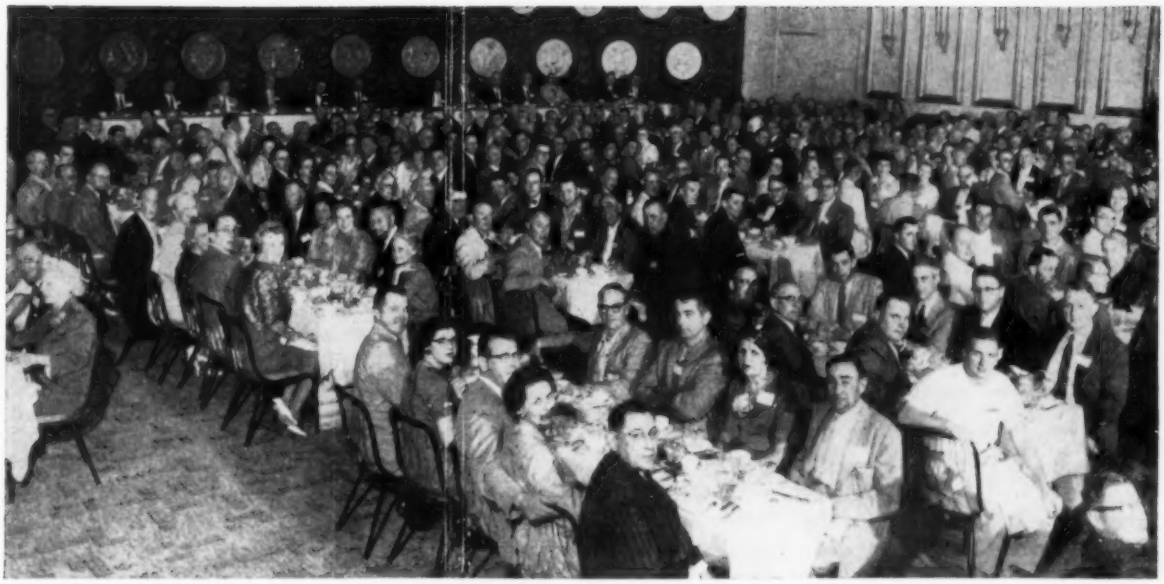
A long-time member of the division, Abe Goldberg (Allis-Chalmers Mfg. Co.), who was chairman in 1932-33, announced his retirement, and introduced his successor in this group, David Wilson. Appropriately, Mr. Eiben indicated that Mr. Goldberg's many years of service to his company and this industry would preclude his absence from future meetings.

Following the luncheon, Mr. Eiben noted the universal approval expressed by the manufacturers with respect to a convention innovation —the round table operating discussions discussed elsewhere in this report. He indicated that Mr. Rowe, as chairman of the convention arrangements committee, deserved considerable credit for the success of this meeting.

Executive Director In his report, J. R. Boyd, executive director of N.C.S.A., stressed the growing importance of the legal side of the business to producers, and the value of competent and experienced counsel. Pointing out percentage depletion as an example, he stated that it is again under fire in Congress. Pressure is now on the 27½ percent allowance of the oil and gas industries but nonmetallic minerals allowances will be next in line. The highway trust fund is in real trouble, said Mr. Boyd, and Congress must do something about it. Aggregates producers were urged to do what they can to make sure that adequate funds are raised somehow.

The new N.C.S.A. cost accounting manual for the industry has been completed and will be ready for distribution soon. Mr. Boyd also reported that the association continues in good financial condition and that a net gain of 9 members during the year has brought the membership total to 163.

Engineering Director In his annual report, Joseph E. Gray, engineering director of N.C.S.A., stressed the work his department has been doing for its members and for the crushed stone industry. For example, when a technical committee recently announced that 2- to 2½-in. maximum size stone for concrete pavements is not satisfactory and recommended a ¾-in. maximum, tests were made



During this greeting luncheon the new officers and executive committee were introduced, and the presentation of certificates to the N.C.S.A. safety contest winners was made.

by his staff which showed that volumetric shrinkage increased sharply with the smaller top size and that there were no compensating advantages. Mr. Gray presented a paper on this subject at the recent meeting of that committee.

The subject of slipperiness in black top pavements has been getting much attention recently, with crushed limestone in general under attack. According to Mr. Gray, each aggregate must be judged on its own merits in this respect, as many soft stones are quite satisfactory, and some harder stones are subject to stripping. Mixing with siliceous sand is helpful in many cases, and interesting new angles are being developed that may change the entire picture. The association's circular track has proved to be an invaluable research tool in this work.

Other activity during the year included field trips to help solve members' problems and also laboratory work, both of a general and basic nature; in addition, service testing was done on difficulties of individual members. Three major research projects now being conducted are as follows: investigation of the cause of softening of graded aggregate base courses; soundness; and effect of maximum size of aggregate on the properties of concrete. Good progress is being made on all of these.

OPERATING MEETINGS

During this convention, two full morning sessions were devoted to consideration of operating problems of interest to producers and equipment manufacturers. The first incorporated (1) a discussion on development of uniform procedures to measure industry-wide quarry efficiencies on a common basis; (2) a symposium on the use, properties, and safe handling of ammonium nitrate explosives; and (3) a study on increasing capacity of existing plants.

An innovation in N.C.S.A. convention proceedings was created for the second operating session. In lieu of scheduling formal papers, a number of round tables were established for simultaneous informal discussions on each phase of quarry production from stripping to stockpiling, plus underground operations, and accident prevention practices. At regular intervals, each of the round tables convened six times, which permitted both producer and manufacturer members to participate in the discussion of as many different subjects as they wished. This schedule was particularly well received, and will probably, with certain modifications based on this trial run, become a regular feature of future conventions.

Quarry Efficiency Tons per man-hour has proved to be the most accurate common denominator in comparing quarry efficiencies. In each of the last two years, a survey of several plants has been made on that basis; results in the second year supported interpretations made on the first year.

Interesting comparisons in this survey, which has been analyzed by T. C. Cooke (Lynn Sand & Stone Co.), were made between large and small primary crushers; on types of stones, *i.e.*, sedimentary or igneous; in terms of plants with more or less than 500,000-ton annual capacity; and between types of crushers.

Plants with more than a 500,000-ton capacity are more efficient than smaller installations. The median for the former proved to be 6.36 tons/man-hour, while for the latter it was 5.58, according to the plants reporting.

Jaw crushers showed a median of 5.97, and gyratories 5.65, while impactors recorded 6.60—all three on an overall basis. In terms of size (larger units included 48x60 jaws and 42-in. gyratories, and the smaller ones involved 42x54 jaws, and 36-in. gyratories) the larger units enjoyed a greater efficiency factor of 5.89, as compared with 5.76 for the smaller.

With respect to the relatively

N.C.S.A.'s board of directors in the pre-convention meeting. Warren C. Rowe (Rowe Contracting Co.), left rear, was elected president of the association.

softer sedimentary formations, a range of 4.30 to 8.93 tons/man-hour was realized from this material, while from the igneous occurrences, a range of 3.90 to 8.37 was reported.

In summary, the most efficient quarry operations (according to the survey) apparently have these features: a sedimentary deposit; capacity of 500,000 tons/year, or more, and larger primary crushers, usually jaw-type.

Another interesting comparison was made on the basis of region—it seems that our southern operators, with an overall median of 5.95 tons/man-hour, enjoy an advantage over their northern colleagues, whose median was 5.69.

Ammonium Nitrate The surge of producer interest in ammonium nitrate explosives was reflected in the symposium on the various factors involved in the use of this material.

Frank J. Shalap (Graham Virginia Quarries, Inc.) contributed several comments from a producer's standpoint, based on his experience with the explosive. Pertinently, since stone must be recovered at the least cost, nitrate is here to stay, Mr. Shalap said. However, while it will do the job when properly handled, he emphasized that it is *not* a low-cost cure-all.

Each quarry is a challange in itself with respect to obtaining most efficient use of the explosive, and all operations present variables in terms of formation characteristics, size of blast-holes used, presence of water, etc.

This point was emphasized—if help is needed and a technical advisor is called in to study the situation, by all means let him do the job and place no obstacles in his path. Further, an assumed knowledge of drugstore chemistry can lead to interesting, but unfortunate, results—*i.e.*, the mixing of ammonium nitrate and additives for blasting needs qualified men with an awareness of chemical values involved.

A better understanding of the properties and characteristics of ammonium nitrate explosives was stipulated by Dr. Melvin A. Cook (University of Utah) as preliminary to its most effective use.

In past years, its development as an explosive was slowed by such problems as the solubility of the material, its low sensitivity, and its recrystallization characteristics. It is an oxidant, and requires a fuel. A significant advance was realized with the development of prilled nitrate, which, mixed with fuel oil in the proportions of 94 to 6 by weight, has become a popular do-it-yourself explosive.

On the other side of the coin, Dr. Cook noted, there are less favorable factors. While in the absence of a sensitizer the material is fairly safe, the presence of a sensitizer in uncontrolled situations can be catastrophic. Accidental contamination can be extremely hazardous as borne out by explosive accidents in its manufacture.

A series of slides depicting results of studies on ammonium nitrate characteristics showed that a 94-6 mixture of nitrate and fuel oil produces an explosive energy of 840 cal./gm. as compared with 800 for 40 percent gel, and 1,400 for blasting gel. In terms of cost, the 94-6 mix, as is generally recognized, is considerably less expensive than 40 percent gel. (However, actual cost must be computed with densities taken into consideration.)

Bore hole pressure comparisons showed the 94-6 AN/FO mix (density of 0.8) to produce a force of 135 tons/sq. in., and 40 percent gel (density 1.4) to give 285 tons/sq. in. Dr. Cook cautioned that if fumes from the explosive reaction are witnessed in a blast, particularly the reddish-brown gases of certain oxides of nitrogen, this indicates a difficulty for which qualified help should be obtained.

Safe handling of ammonium nitrate explosives is not necessarily an altruistic goal of the Bureau of Mines, according to Dr. Robert W. Van Dolah, chief of the division of explosives technology in Region V of that agency. More pertinently, the Bureau's interest lies in safeguarding applications of the material and in the dissemination of information on common-sense precautions to be observed.

What are the hazards involved? Dr. Van Dolah pinpointed these: an unfortunately common complacent attitude toward "fertilizer grade" material; fire—often a consequence of careless storage; and misfires in blasting operations.

It must be remembered, he said, that despite ICC regulations, the material must be regarded as an explosive. Further, fire is a definite hazard even in raw nitrate storage, and while it has been known to burn without exploding, reliance on that point could prove disastrous.

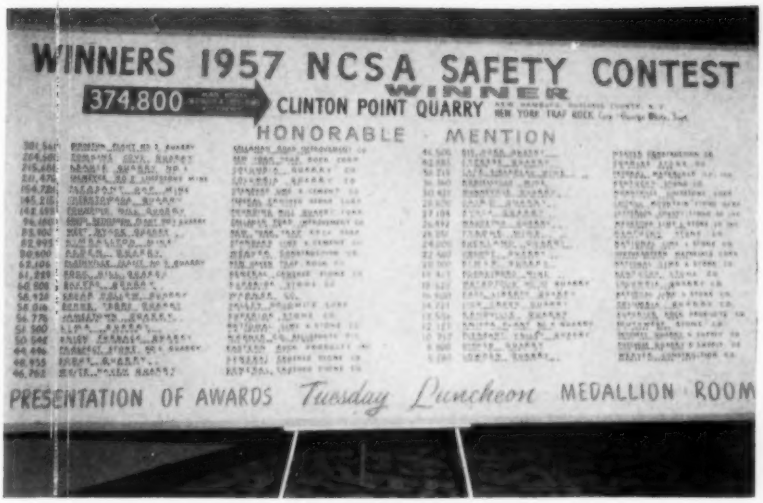
Close attention to its storage is required in terms of spacing, separation from fuel areas, smoking in the vicinity, etc. Along those lines, the field handling of nitrate and fuel oil can be a problem from the safety standpoint.

Don't store the materials near a populous area, the speaker said. He also emphasized that when it is stored with explosives, it must be regarded as such. In the use of fuel oil, or other additives, mixing dictates considerable care. Know what you're doing; or if you don't, get expert help! The safest mixing procedure, it was suggested, is probably that of pouring fuel oil over prills

while the latter are still in their bags. If a mixer is used, it must be of a type that would not create friction of compaction in the mix.

If pneumatic equipment is utilized for loading blast holes, care must be taken to avoid static electricity. While nitrate has actually been resistant to detonation from that factor, it is nevertheless a hazard. With respect to letting a nitrate-fuel oil mixture stand overnight before loading holes, there is no hazard present other than that inherent in having an explosive mixture already made.

In essence, Dr. Van Dolah pointed out, the same care should be given to the handling of ammonium nitrate as to any explosive.



The poster bearing the names of the 1957 N.C.S.A. safety contest winners was prominently displayed throughout the convention.

Increasing Plant Capacity Significant gains in efficiency and production through revisions made in several of his company's existing operations were detailed by W. Julian Parton (assistant to the president, General Crushed Stone Co.). The higher production, in terms of both total output per hour and output per man-hour, was attained by several different methods, each related to the specific problem to be attacked.

Introductory comments indicated that production depends on the size of equipment provided in a quarry and crushing plant, plus proper coordination of the various phases. Factors adversely affecting production were indicated to include the following: breakdown of equipment in quarry or plant; inadequate loading and haulage equipment to maintain capacity feed to the primary crusher; poor fragmentation in the quarry; crushing and screening plant bottlenecks; excessive circulating loads in closed circuits, causing overloading of certain equipment; and in some instances the attitude of employees.

The cause of repeated delays can be located through time studies, analyses of flow diagrams, and perhaps most quickly from the men actually engaged in running the plant.

On the basis of sound economics, if a producer can meet an expanded market with additional tonnage obtained by eliminating bottlenecks, he is in the position of making a profitable return on "bonus" tonnage which is probably obtainable without an increase in labor cost. On the other hand, if the extra tonnage resulting from increased capacity is not subject to expanded market demands, the plant will require fewer operating hours to produce the same output as formerly, with a consequent reduction in labor cost.

Advantages realized by General

Representatives of 1957 N.C.S.A. Safety Contest Winners. Top row: R. L. Walker, Cheektowaga Quarry, Federal Crushed Stone Corp., Cheektowaga, N. Y.; John Jorgensen, Tomkins Cove Quarry, New York Trap Rock Corp., Tomkins Cove, N. Y.; George Foster, West Nyack Quarry, New York Trap Rock Corp., West Nyack, N. Y.; Charles Bass, Plainville Plant No. 4, New Haven Trap Rock Co., Plainville, Conn.; A. B. Schmidt, Metropolis No. 10 Quarry, Columbia Quarry Co., Metropolis, Ill.; G. B. Phillips, Kimballton Mine, Kimballton, Va., and Pleasant Gap Mine, Pleasant Gap, Pa., Standard Lime & Cement Co.; Harry Wells, Kingston Plant No. 3, Callanan Road Improvement Co., Kingston, N. Y.; A. B. Radford, Bonne Terre Quarry, Valley Dolomite Corp., Bonne Terre, Mo.; W. H. McGee, Pounding Mill Quarry, Pounding Mill, Va.
Middle row: J. R. Joseph, following plants of National Lime & Stone Co.: Lima (Ohio) Quarry, Buckland (Ohio) Quarry, Rimer (Ohio) Quarry, and East Liberty (Ohio) Quarry; Leon Lewis, Cairo Quarry, Catskill Mountain Stone Corp., Cairo, N. Y.; H. D. Perry, Knippa Plant No. 4, Southwest Stone Co., Knippa, Tex.; Charles Dayhuff, Osgood Quarry, South Eastern Materials Corp., Osgood, Ind.; George White, Clinton Point Quarry, New York Trap Rock Corp., New Hamburg, N. Y.; H. H. Kirwin, Eastern Rock Products, Inc., Utica, N. Y., chairman, N.C.S.A. Accident Prevention Committee; Emil Berry, Avoca Quarry, Jefferson County Stone Co., Inc., Avoca, Ky.; Robert Wright, South Bethlehem Plant No. 1, South Bethlehem, N. Y.; D. R. Knott, Cypress Quarry, Charles Stone Co., Cypress, Ill.
Bottom row: G. L. Ransier, Sodus Quarry, General Crushed Stone Co., Sodus, N. Y.; J. P. Civial Jr., Rock Hill Quarry, General Crushed Stone Co., Quakertown, Pa.; Burr Shaver, White Haven Quarry, General Crushed Stone Co., White Haven, Pa.; W. J. Clark, Munnsville Quarry, Munnsville, N. Y.; Harold Cessford, Alden Quarry, Alden, Iowa, Big Horn Quarry, Warren, Mont., and Lowden Quarry, Lowden, Iowa, Weaver Construction Co.; W. P. Milne, Russellville Mine, Kentucky Stone Co., Russellville, Ky.

Among the past chairmen of the division honored at the Manufacturers' Division luncheon were (l. to r., clockwise): Wayne W. King (W. S. Tyler Co.); Abe Goldberg (Allis-Chalmers Mfg. Co.); B. R. Maloney (E. I. Du Pont de Nemours & Co.); J. C. McLanahan (McLanahan & Stone Corp.); R. Wills (Baldwin-Lima-Hamilton Corp.); J. H. Fulkerson (Jay Harper Company); and I. F. Deister (Deister Machine Co.).

Crushed Stone through improvements and elimination of typical bottlenecks at several of the firm's plants were described by Mr. Parton. At one plant, involving an original capital outlay of more than $1,500,000, a primary final sizing screen was replaced with a larger, different type of unit. Estimated cost of the replacement was $15,000, less than 1 percent increase in total plant investment, and the 10 percent increase in capacity achieved is expected to result in another $85,000 of annual gross revenue.

Another plant had been forced to go to overtime operation in order to meet local market demands for fine sizes of stone. Although a bin-fed 4-ft. shorthead cone crusher had been provided for recrushing, regulation of feed to this unit was troublesome and it could not be operated constantly at capacity. The solution? Feed for this crusher was diverted to a new surge pile installation incorporating a 7-ft. diameter reclaiming tunnel housing an F-45 Syntron feeder. With the 24-in. conveyor, the total project cost approximately $21,000. Improved feed control resulted in a jump from 54 percent to 74 percent in sizes smaller than ½-in., as well as a gain in total plant production from 289,000 to 312,000 tons.

At still another operation, highway construction in the area gave promise of doubling requirements then met by a 250,000-ton facility. To meet the increased demand, expected to last for several years, it was decided to replace a 36x48 primary jaw crusher with a 46x50 impact type. To take advantage of the greater primary crushing capacity without rebuilding the plant, the flow was designed to provide for scalping minus 1¼-in. material from the crusher product and deliver this material to a new washing plant.

Following this revision, it was found that the new crusher produced more minus 1½-in. material than anticipated, and it was necessary to fit the scalper with ¾-in. screencloth. Throughs, about one-third of the plant feed, from this screen are now conveyed to the washing plant, while the remainder goes to the main plant.

The entire installation (which also required putting in additional quarry loading and haulage equipment) was made with the minimum of change and expense, and resulted in a 9 percent increase in tons/man-hour. Another important advantage realized involved a marked improvement in particle shape of the crushed product.

Miscellaneous improvements reported by Mr. Parton included increasing capacity of certain older jaw crushers by speeding up these units from 10 to 15 percent. Labor efficiency has been steadily improved through the installation of automatic controls and devices including bin gate and feeder controls, an electric ear for control of ball mill feed, limiting switches, etc.

Round Table Discussions

Enthusiastic participation was evident throughout the round table discussion schedule, which was presided over by T. W. Jones (New Haven Trap Rock Co.). It was evident that every subject group held was of interest to several operators.

In each discussion there was an interesting exchange among producers on specific problems, methods, and equipment performance. Significant contributions to these discussions were frequently volunteered by manufacturer representatives.

In discussions on primary crushing and surge storage, the *pro's* and *con's* of various types of primary reduction units were commented upon, particularly in terms of the different materials being processed. Several producers noted that an excess primary crusher capacity is a help in allowing the balance of the plant to operate, from a surge, for a longer period than the quarry. Surge silos were indicated as an excellent means of providing a dry feed for subsequent dry screening phases. Varied experience with surge pile locations were also noted, *i.e.*, between primary and secondary reduction, or between the latter and the screening plant.

Hole spacing, type of stone, vibration, and explosives were among the primary considerations in the discussions on drilling and blasting. With respect to drills, one producer commented that, all things being equal and with due consideration given to variable stone characteristics, rotary drills may have an edge over churn and down-the-hole types in footage/hour. Another operator related his experience with the use of ammonium nitrate in waterproof bags in blasting wet holes, and noted that there were excellent results. It was also pointed out that prills had been poured into wet holes, and that a good shot subsequently was realized. However, stronger detonators were required to do the job. Drill steel life came under ap-

praisal with comments to the effect that there had been a lack of uniformity among the steels, plus complaints on the failure of either the threads or the rod, or both.

Stone sand production methods and problems were discussed in terms of various reduction units—hammermills of either fixed hammer or swing hammer type, Gyraspheres, and rod mills; reference was also made to the critical factor of particle shape. Difficulty with blinding of screencloth in screening this material was reported by some producers. The suggestion was made that applying a suction below the bottom deck of such screens would aid in preventing blinding.

Many comments on loading and haulage phases centered around the variable hourly production experienced on the basis of tonnage per cu. yd. of shovel dipper capacity. A range of 100 to 250 t.p.h. per dipper cu. yd. was indicated. One operator raised the question as to which would be more efficient—one large, or two smaller shovels in loading operations. In view of investment, labor cost, etc., it was suggested that one larger unit would probably be best; however, primary crusher capacity was pinpointed as a limiting factor.

Particle shape was of paramount interest in the discussion on secondary crushing and recrushing. In the light of that factor, experience with both pressure and impact-type reduction units was related. With respect to roll crushers, the comment was made that these are perhaps best used when the reduction ratio (feed/finished product) is relatively small. Comparisons were also drawn among roll mills, ball mills, and cage mills on capacity and maintenance.

In the discussions on screening, a critical factor brought up concerned spreading material evenly over the initial area of a screen to avoid losing so much effective screening area. One method described involved the installation of a vibrating plate between a stone box and the screen which it feeds. This arrangement proved quite satisfactory in spreading the material discharged onto the screen. Another operator used a section of 6-in. opening screencloth with which the stream of material fed to the sizing screen was broken up and spread.

Large Size Aggregates The successful use of larger-size stone in bituminous base construction was described by H. M. Bixby, N.C.S.A. field engineer. Defining large-size aggregate as material of which at least 20 percent is retained on a 1-in. sieve, Mr. Bixby commented that this type has become unpopular with engineers and contractors in many areas—due in part to the problem of segregation. Despite certain obvious advantages of larger aggregate, there has therefore been a trend in a large part of the country toward the use of smaller aggregates in flexible pavements.

While tending to reduce segregation, smaller materials are more costly to produce. On the other hand, large-size aggregate is more economical in bituminous mixes because of its lower asphalt requirement, and it has higher stability and resistance to displacement.

With these factors in mind, Mr. Bixby stated, he undertook a survey last year of construction in areas where the larger aggregates were being successfully used—specifically, in New York, Pennsylvania, and Ohio. Data compiled in this study were shown on slides, which presented details on specifications for aggregate and mixture composition in the three states, plus design variations, methods of placement, mix costs, and field tests.

In summary, it was noted that engineers and contractors contacted in this survey are of the opinion that these large aggregate bitumi-

New division officers and members of the executive committee were introduced during the Manufacturers' Division luncheon. W. E. Collins Jr. (Atlas Powder Co.), third from left at the head table, is the new chairman.

Hostesses for the ladies' entertainment program were: Mrs. Clarence Camp II, Mrs. Nelson Severinghaus, and Mrs. L. A. Eiben.

nous bases have some of the advantages of both macadam and dense graded base course types, with few of the disadvantages. Further, engineers in the three states were very enthusiastic about the large-size aggregate mixes, and the excellent stability and record of this type of base should warrant its trial and use in other areas.

Bituminous Concrete An excellent talk on *Bituminous Concrete Placing — Operation and Control* by J. Dunbar of the Asphalt Institute, was illustrated with a complete set of slides. It was emphasized that excellent materials, design, and manufacture can be cancelled by poor placement. This means that proper construction from the base course to the surface coat, accurate levels, edges, etc., are just as necessary as proper plant control, to achieve the best results in a bituminous mix.

SESSION FOR SALESMEN

An entire morning session was devoted to papers on various aspects of selling, and to discussions of them. V. G. Aubry Jr., vice-president in charge of sales of Houdaille Construction Materials, Morristown, N. J., presided at this session. He stated that many company failures are due to poor sales management.

Technical Service *Technical Service to Sales*, according to C. T. Johnson, district sales manager, General Crushed Stone Company, Wilkes-Barre, Pa., requires that a salesman have basic knowledge of his product, its characteristics, how it is made, how it should be used, etc. He should know the necessary tests, the problems of production and use, specifications, etc., and why flats, impurities, etc., are objectionable. He should investigate any condemnations, as the condemned material is often actually satisfactory. He should sell products which will not place undue hardship on the plant. He should be informed on specific gravity and yield, and be able to estimate requirements; he should know cement and bituminous concrete design, and be familiar with his competitor's products, etc. In conclusion, Mr. Johnson said that a salesman with technical knowledge is helpful both to his employer and customer, and has the edge on his competitors; but he should suggest, not advise.

Sales Promotion In discussing the topic *Sales Promotion*, C. F. Heidtman, sales manager of the National Lime and Stone Company, Findlay, Ohio, explained that his company sells a wide variety of limestone and lime products to a wide variety of users. Some products and some areas need selling; others do not. Selling is done by direct contact, by giving service on shipments, and by providing technical information. Salesmen are started out as plant clerks, so that they can meet customers and production men and learn their problems. The company's salesmen attend all town and county meetings in order to know people and be known and to get advance information on coming business. Some newspaper and trade magazine advertising is done, and the sale of agstone is now being stressed. Following up on sales is probably the best way of building up good will.

According to Mr. Heidtman, the company gives out very few gifts and gimmicks, and those mainly at Christmas. In the ensuing discussion it developed that one company quit giving gifts because some buyers' employers objected to this practice. No falling off of sales has been noted. Several other companies now make donations to charity in the customers' names and so inform them. In Dade County, Fla., the Miami area, producers are doing this by mutual agreement, and the practice is spreading. Others send Thanksgiving and Christmas cards instead of gifts and find that the value of the gift is unimportant, but that the thought is appreciated.

Sales Co-ordination, Credit Price, Collection Policies According to Harry E. Battin Jr., vice-president, Callanan Road Improvement Company, South Bethlehem, N. Y., salesmen should not be collection agents. Instead, they should watch and report developments, credit ratings, etc., of both new and old customers. A credit manager must have a belief in the fundamental honesty of people if customer good will is to be maintained; but he should take prompt action against bad risks.

For instance, when it is known that a contractor has been paid for a job, a producer should insist on being paid by him. His company prepays freight only to governmental bodies which require it. All C.O.D. orders must be paid for before they are dumped. If the stone is brought back, the trucker still receives his pay. The one problem as yet unsolved, he said, is that of agricultural limestone, which is sold through truckers. Often a farmer cannot pay the trucker for 6 to 8 months—until his crop is sold—so the company must carry the truckers for the same period.

The company's procedures were

then described by Mr. Battin. First, when a customer does not take the discount, a warning flag goes up. Then a series of Powers (Chicago) collection letters is used; these are polite but increasingly firm, and are signed by the salesman. If the letters fail, the account is then turned over to the Mercantile Claims Division of Dun and Bradstreet. A letter is sent to the customer telling him that this has been done, and often the action results in payment before any further step can be taken. Of course, Mr. Battin pointed out, a good lawyer should be retained. As a result of these policies he has had a bad debt loss of only 1/25 of 1 percent of sales over the last five years—only 1/16 of 1 percent when collection costs are included.

In answer to questions, Mr. Battin said that when a customer is taken off the list due to nonpayment, the plant management, dispatchers, etc., are notified at once. He added also that, in addition to invoices, statements are made every month, and all customers receive a letter thanking them for their business, asking for payment, or whatever is required. This practice really pays.

Co-ordination of Sales, Production In describing his company's method of *Co-ordination of Sales and Production* V. G. Aubry Jr., vice-president in charge of sales, Houdaille Construction Materials, Morristown, N. J., stated that the primary sales policy is to have the right kind of material in the right place at the right time and at the right price.

A data sheet or plant schedule is used for each plant, and forecasts of demand are made as far as 3 months ahead by individual sizes and up to 6 months ahead for total output. This work is done late in the month and the information is then sent to the sales vice-president, who checks and summarizes.

The sales and operating departments co-operate in making forecasts on the sheet, Mr. Aubry stated. It is then sent to the operating people for inventory control and then to the operating vice-president, who checks and summarizes. The accounting department makes calculations, comparisons, etc. About the 4th of each month a sales meeting is held at which sales and operating heads give the sheet a final review. Blueprints are sent out to district sales heads and plant foremen. At this point a sales forecast is made on volume and prices for each plant for each of six months. The accounting department checks this forecast and sends it with a purchase forecast to the main office. Quarterly forecasts are also made for a year ahead, giving only output and dollar sales estimates.

Mr. Aubry stated, in answering questions, that excellent results are being obtained with the system, largely due to proper communication between departments. Estimates have stayed within 5 percent, the main deviations having been due to weather, and these are recorded for future guidance. This practice keeps everyone aware of inventories and other aspects of the business. In conclusion, he pointed out that this co-ordination of sales and production is just as important and just as practicable for a smaller company, which can achieve the same results in a less formal manner.

Accounting Manual With Arthur Goff (Wallace Stone Co.), chairman of the N.C.S.A. cost accounting committee as presiding officer, a round table discussion on the new N. C. S. A. accounting manual was conducted by John J. Fox (partner, Lybrand, Ross Bros. & Montgomery), and Carl M. English (associate, Gall, Lane and Howe).

Designed as a tool for use in setting up accounting methods and procedures, the manual, Mr. Fox noted, is expected to provide aid in delineating budgets, with consequent improvement in operations through closer cost analysis and control. Along with forms for special purposes, the manual contains forms to be used as guides for reports to management, stockholders, etc. Also included is a section devoted to basic points on percentage depletion.

Who can best use the manual? Production personnel, salesmen, and administrative executives were suggested as those who could derive most benefit. In actual application, it was noted that each man concerned can find his responsibility in specific accounts and reports.

Mr. English pointed out that the manual should aid in establishing proper tax schedules for depreciation purposes, and in setting up particular cost centers for ordinary treatment processing, plus allocable items involved in the determination of the 50 percent limitation on percentage depletion deduction. He cautioned, however, that the section on depletion is primarily a summary, and necessarily covers this field only up to the date of the manual's publication, *i.e.*, November, 1958.

The comments above led to a lively question-and-answer period. Producers showed considerable interest in allowable costs (in depletion computations), depreciation—with particular emphasis on salvage value determinations—and accounting for related repair expenditures. As a consequence, it was indicated that the cost accounting committee will seriously consider expanding its efforts into more extensive considerations of depreciation factors.

At another meeting Mr. Goff reviewed the developments which led up to the formation of this manual committee in February, 1956. The resulting manual was finally approved by the N.C.S.A. board of directors in July, 1958. It will soon be ready for distribution to the members.

Legal—Labor A general discussion on the subject of *Federal Laws and Legislation of Significant Interest to Stone Producers* was led by John F. Lane, association counsel, who stated that several states are working on regulations which would require a license to mix ammonium nitrate explosives on the job. The possibility of similar federal legislation is also rumored. Apparently, the mechanical mixing of carbonaceous material is most objectionable. He questioned whether adding oil to this material is actually manufacturing an explosive and pointed out that this product has the advantage of safety in transit and storage of the separate components. He urged producers to watch developments in their states.

Legislation affecting percentage depletion should also be watched, Mr. Lane pointed out. Proposed legislation would change the cutoff point for brick and cement manufacturers to the grinding stage. He also pointed out that the Treasury Department has no hard-and-fast interpretation of what constitutes an operating unit. In closing, Mr. Lane said that the public seems to be more aware of the labor problem than is Congress; but that the public is being misled into thinking that the government is solving the problem, when it is not. Effectively combating the political power of labor unions will take time, money, and centralized supervision of efforts.

In an earlier address Mr. Lane stated that although the Democrats swept the last election, the real winner was the political power of labor—in spite of two years of exposure of the corruptness of union leadership. According to the *Congressional Quarterly*, there are now 238 pro-labor members of the House and only 175 anti-labor; and 68 senators are pro-labor and only 28 anti-labor. In the last election, labor candidates elected 72 percent of the representatives, 67 percent of the senators, and 74 percent of the governors.

Mr. Lane pointed out that it took labor 15 years to get political control, and that the solution of this problem will also take time. Labor leaders represent only 15,000,000 union members out of the 104,000,000 eligible voters in this country. Public opinion must be awakened and informed, and political pressure must be developed to the point where legislation restricting union activities can be passed.

Skid Prevention *Highlights of the First International Skid Prevention Conference* were discussed by A. T. Goldbeck, engineering consultant for N.C.S.A. Every motor vehicle exerts structurally damaging effect on road surfaces, and the increasing number of vehicles and higher speeds are making this more apparent. The high percentage of accidents involving skidding, Mr. Goldbeck stated, concentrated attention on the slipperiness of road surfaces, which eventually led to the First International Skid Prevention Conference, held at Charlottesville, Va., September 8 to 12, 1958.

At this conference it was pointed out that many factors besides the road materials used enter into the skidding problem, and all of these should be investigated. These include the design, construction, and use of pavement; the design of the vehicle and the tire; and driver behavior. The purpose of the conference was to exchange and inventory existing knowledge, to develop a comprehensive program of research, to demonstarte and correlate test results of existing equipment and methods for measuring skid resistance, and to initiate a program for developing standard testing procedures.

Many interesting conclusions were developed on these various factors, but those most important to crushed stone producers had to do with road surface properties. That the skid hazard is greatest early in the rain—due to oil, etc., on the surface—and when there is excessive bitumen is granted, Mr. Goldbeck conceded, but he pointed out that other factors are still in question.

Conflicting data indicates that both open, coarse textural surfaces and those with high percentages of very fine aggregates can have the highest coefficients of friction and can also become slippery as a result of the polishing action of rubber-tired traffic. The softer stones generally polish sooner than the harder ones, but there are many exceptions. It was stated that the most effective method now known of overcoming slipperiness is in the use of a fine-grained silica sand asphalt surface. In concrete surfaces air entrainment and the use of more sand in the mix to create a thicker mortar surface seem to offer possibilities.

Safety Progress A report on *Safety Progress in the Crushed Stone Industry* was given by H. H. Kirwin (Eastern Rock Products, Inc.) chairman of the N.C.S.A. Accident Prevention Committee. This association's contest is now 32 years old, and participation has grown from 40 plants in 1926 to 105 in 1957. In 1926 only two plants had no lost-time accidents, compared to 45 in 1957. He pointed out that during the years the accident frequency rate has steadily declined, but that man-hours worked and the accident severity rate fluctuate. The accident record of N.C.S.A. members, he said, is much better than that of the crushed stone industry as a whole.

Several steps have been taken recently which, according to Mr. Kirwin, should increase participation in the contest. Contest forms have been simplified and their number reduced. It is now necessary to fill out only a brief entry blank and four condensed quarterly reports. The contest has also been divided into five size categories, based on man-hours worked, in order to give smaller plants a chance to win top awards. These categories are as follows:

Class A - 0 to 25,000 man-hours
Class B - 25,000 to 50,000 man-hours
Class C - 50,000 to 100,000 man-hours
Class D - 100,000 to 200,000 man-hours
Class E - over 200,000 man-hours

There will be an award for the winner in each class, plus the usual scrolls for injury-free operations.

Entertainment The program of entertainment was restricted somewhat in order to give ample opportunity for private plans. The highlight was the Hawaiian Luau held outdoors in the Americana's beautiful patio. This tropical setting was ideal for the Hawaiian Revue presented by the one and only Hilo Hattie and her troupe of Polynesian dancers.

The provisions for entertainment of the ladies while sessions were in progress met with general approval. The official hostesses were: Mrs. Clarence Camp II, Ocala, Fla.; Mrs. L. A. Eiben, Cleveland, Ohio; and Mrs. Nelson Severinghaus, Decatur, Ga.

Morning coffee was provided daily in the Ladies Headquarters, and there was a get-acquainted tea on the first day. On Thursday a boat cruise of the waterways in the Miami area was enjoyed by the ladies.

N.C.L.I. Meeting

(*From p. 89*)

latter must keep abreast of developments in a significant area—that of current research on slipperiness of pavements. At this stage, a finger has been pointed at limestone aggregates as being guilty of causing slipperiness, due to "polishing" under traffic loads.

Since this interpretation has been found to be based partly on rumor, and not on actual test results, the N.C.L.I. specifications committee can do the Association's members a real service by countering with factual results on "polishing" investigations.

Other sessions of particular interest in the overall meeting included those in which the N.C.L.I. members joined with the N.A.L.I. group for a discussion of operating problems and new developments, also to hear a member of the Internal Revenue Service speak on depreciation factors, and to attend the annual Congressional Banquet, at which the Honorable Calvin D. Johnson (former Republican congressman from Illinois) was the featured speaker. These sessions are reported in detail on pp. 90-94 of this issue.

The next N.C.L.I. meeting will take place in Chicago at the Sheraton-Blackstone on June 9, when the board of directors will hold their mid-year session. The fifth annual convention is scheduled to follow the N.A.L.I. meeting in Washington, D. C., next January.

N.A.L.I. Convention

(*From p. 94*)

it was emphasized, have never relinquished the right to make a depreciation adjustment if there is a clear and convincing basis for such change.

Special Features The opportunity to meet and talk with several senators and congressmen vis-a-vis has been a feature of the Congressional reception and banquet for several years. The Honorable Calvin D. Johnson, former congressman (Ill.), banquet speaker at this convention delivered a stirring address entitled, *Don't Sell America Short.*

For the second successive year, an afternoon was scheduled exclusively for meetings among producers and representatives of the Manufacturers' Division for discussion of individual operating problems, an opportunity which was used to advantage by most producers.

An interesting program for the ladies was headed by Mrs. W. E. Stone. In addition to joining some open sessions, the ladies enjoyed a schedule replete with special entertainment and opportunities to visit historical points.

Another feature of the convention was the Manufacturers' Division guest night, at which manufacturer-members were hosts. This has developed into one of the highlights of the social affairs since its inception a few years ago. This year, guests were welcomed by George S. Harvey (Owens-Illinois Multiwall Bag Division), chairman of the Manufacturers' Division.

Talc, Soapstone, Pyrophyllite Show Slightly Higher Output

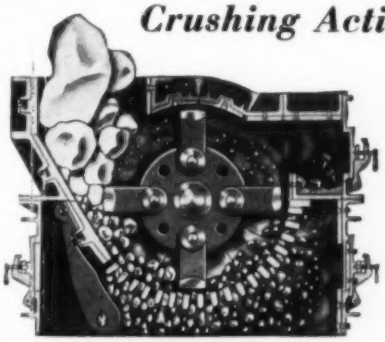
Combined production of talc, soapstone, and pyrophyllite increased 2 percent in 1958 over 1957, according to preliminary estimates of the U. S. Bureau of Mines. The increase resulted mainly from a substantial rise in the output of talc in Texas. Smaller increases were reported from Maryland, Montana, New York, and Vermont. Minor decreases were noted in Georgia and North Carolina. Total production was estimated at 698,000 short tons in 1958, against 684,000 in 1957.

On the basis of statistics for the first 9 months, 1958 exports reached a new high of 50,000 short tons, an increase of 25 percent over the 1957 total. Imports (about 20,000 tons) were virtually the same as in 1957, coming from Italy, France, Canada, and India.

Holly Sand and Gravel Company, Holly, Mich., is merging with the Oxford Mining Company of Pontiac, Mich., the A. S. Lefler Gravel Company of Davison, Mich., and the E. P. Brady Company of Flint, Mich. The enlarged firm will be known as the Holly Manufacturing and Mining Company.

Get the CAPACITY and the PRECISE
Crushing Action You Require with

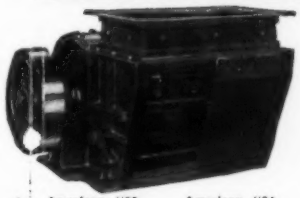
AMERICAN "ACS" HAMMERMILLS



For efficient low-cost reduction of one-man size stone or screen rejects to *uniform* roadstone, aggregate or agstone sizes—Americans are built in three sizes . . . *with capacities up to 250 TPH.*

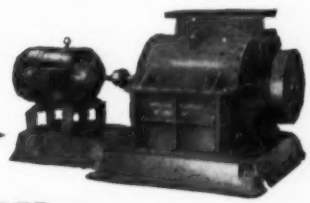
Center feed models in each size assure a higher ratio of fines by lengthening travel of stone in hammer cycle.

Conventional front feed models minimize fines.



American "30 Series" to 100 TPH

American "24 Series" to 50 TPH



Write for "Better Stone Crushing"

American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1059 Macklind Ave.
St. Louis 10, Mo.

Enter 115 on card, page 139

Contract

This air view of the Rowe operation near Malden, Mass., shows the rough terrain in which it is located. The quarry is one of New England's oldest.

ANOTHER P&D EXCLUSIVE

ALMOST in the shadow of Bunker Hill and within sight on a clear day of the Old North Church whose steeple gave forth the signal for Paul Revere to commence his memorable ride in 1775, is one of Boston's oldest rock quarries, operated by the Rowe Contracting Company of Malden, Mass. This firm has produced road metal, shoreline riprap, and concrete stone since the turn of the century.

The rugged terrain quarried actually borders on the salt water of Massachusetts Bay on the east and Metropolitan Boston on the south. For many years it was an isolated spot although it was only six miles from the golden dome of the State House. Powerful horses and rugged dump wagons once moved slowly from the quarry scales to travel over pitted, twisted roads; today modern trucks travel over a network of highways, bridges, and tunnels to deliver crushed stone from the plant to local markets.

Igneous rock of the rhyolite family is drilled, for the most part by Joy TDM 500 drills, on a 12x12 pattern, with 4 - in. carbide bits. Penetration is from 30 to 45 ft., as conditions require. A combination of gelatin dynamite and ammonium nitrate prills is employed for successful shattering of the rock; a Koehring crane with a 6,500-lb. drop ball takes care of required secondary breakage. Heavy Euclid dumps fed by a 93-M Marion shovel provide a constant flow of rock to the crushing plant, where Farrel-Bacon jaw crushers and Traylor and Allis-Chalmers gyratories reduce this hard New England rock to its various marketable sizes.

As is true of many older quarries, the rapidly expanding population of a great city has moved out and beyond the Rowe quarry site. A delicate balance is therefore required between production operations and community life. Not the least important factor is a first-class public relations program.

Founded by the late Ransom Rowe in 1907, the Rowe Contracting Co. presently is headed by Ransom Rowe II, president, Warren C. Rowe, treasurer (recently elected president of the National Crushed Stone Association), and Harold R. Brownson, vice-president. These executives belong to various local civic groups and endeavor to remain on friendly terms with the community, to the end that quarrying operations will be fully accepted as a normal part of neighborhood life.

The Rowe Contracting Co. is also part owner of another local quarry originally started by Colonel G. W. Goethals of Panama Canal fame. This is the Winchester Crushed Stone Company.

An important and growing segment of the Rowe operations is that of maintaining drilling operations for other quarries in New England. Producers have found that it is economically sound and financially wise to let the Rowe company and its heavy drills and compressors take over the job of putting down holes in their respective quarries. Rowe has the equipment and the experience to give quarry after quarry in New England the raw rock it needs for crushing purposes, obviating the need of heavy investment in this field by the quarry owner. In such cases it is common practice for the owner or his powder company to load and shoot such

Drilling and Blasting

work done for other producers and road contractors important sideline of ROWE CONTRACTING COMPANY

One of the many tractor-mounted drills used by Rowe for quarry drilling. A wide range of sizes is represented among the units employed.

holes. An additional benefit to the producer is that under pressure for more production Rowe can provide extra drilling equipment on short notice to tide him over.

Contract drilling for other quarries assumes a variety of problems, depending upon the nature of the rock encountered and the type of crushing equipment operated by the quarry owner. Rowe specializes, however, in drilling 4-in. vertical holes on a 12- by 12-ft. spacing and burden pattern, with benching heights up to 50 ft. This procedure permits unusually good powder distribution for the very hard rock encountered, contributing to good rock breakage; it also enables primary shovels to operate efficiently, as well as economically, and goes far toward eliminating waste ground vibration where millisecond delay caps are employed. The above drilling pattern may be varied slightly from one quarry to another, depending upon the sizes of the primary shovel and crusher.

Still another problem is solved by horizontal drilling as far as 32 ft. where well drilling is first employed on a very high face down to within 30 ft. of the quarry floor. Such "toe" drilling permits the blasting out of a clean, straight face to the floor grade; it also greatly reduces the ground vibration from blasting which was formerly experienced when the well holes were carried down below the quarry floor.

Such procedures may be varied when the objective is to get out shoreline riprap, as was done recently by Rowe for the new international ferry terminal at Bar Harbor, Maine. In a nearby quarry the desired rock was obtained by a wider drilling pattern consistent with the type of terrain. Over 40,000 tons were successfully produced for shoreline protection.

Principal air equipment used by Rowe consists of 600 c.f.m. compressors of Chicago-Pneumatic or Ingersoll-Rand manufacture. One of the first users of the new design Gyro-Flo compressors introduced several years ago, Rowe now has 18 such units in service, all powered by General Motors diesel engines.

(Continued on page 122)

Horizontal drilling can be done as far as 32 ft. with tractor-mounted units, after completion of well drilling. This method permits blasting a clean straight face.

MACKS...for every

MACK MODEL LRX 15-TON DUMPER

Extra trips per shift are won by Mack Model LRX's jack-rabbit agility in starting, turning and backing with capacity loads aboard. Built to shrug off the relentless pounding of big-yardage shovels, LRX is a hustler over the flat or up steep grades. LRX is loaded with features for top performance and economy: Mack or Cummins diesel engines up to 220 hp . . . powerful air brakes for steep descents . . . Mack ten-speed transmission . . . Planidrive rear-axle assembly.

CONDENSED SPECIFICATIONS

PAYLOADS: Rear dumper, 15 tons.

DIESEL ENGINES: 170 hp, naturally-aspirated Mack Thermodyne; 220 hp, naturally-aspirated Cummins; 205 hp, turbocharged Mack Thermodyne.

TRANSMISSION: Mack, selective, constant-mesh, 10 speeds forward, 2 reverse.

CLUTCHES: Mack single-plate, 253 sq. in. engagement (for 170 hp Mack Thermodyne); Mack two-plate, 416 sq. in. engagement (for other sizes).

FRONT AXLE: Mack, heavy-duty, drop-forged I-beam.

REAR AXLE: Mack Planidrive, with final reduction through planetary gear train within wheel hubs.

BRAKES: Full air, with 7¼ cu. ft. compressor.

FRAME: Wide flange, rolled section I-beam.

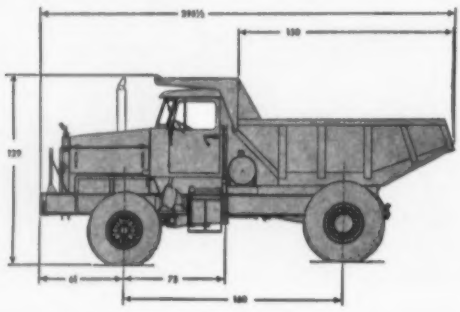
SPRINGS: Front, semi-elliptic with Rubber Shock Insulator suspension; rear, progressive-rate semi-elliptic with cam face slipper ends and radius rod.

TIRES: Standard: Front, 12.00-24 (16P) rib; rear, 14.00-24 (18P) lug. Optional: Front, 13.00-24 (18P) rib; rear, 16.00-25 (20P) lug.

WHEELS: Cast, spoked.

STEERING: 60′ turning circle diameter.

DUMP HOIST: Twin, double-acting, 8″ cylinders providing 70° dumping angle.



MACK MODEL LVX 22½-TON DUMPER

Built to pit power and strength against slam-bang job sites, Mack LVX sticks to the job for years of sustained, like-new performance. Rugged power-train offers a 300 or 335 hp diesel engine, Mack overgeared transmission (with two-speed compound or torque converter), and Mack Planidrive rear axle. For smooth, swift maneuverability it's in a class by itself—thanks to ideal power steering system, air-assisted clutch, and offset cab for maximum visibility front and rear.

CONDENSED SPECIFICATIONS

PAYLOADS: Rear dumper, 22½ tons.

DIESEL ENGINES: 320 hp, supercharged Cummins; 335 hp turbocharged Cummins.

TRANSMISSIONS: Mack, selective, constant mesh, 8 speeds forward, 2 reverse; converter and Mack 4-speed transmission; Torqmatic converter and transmission.

CLUTCH: Mack two-plate, air-assist with manual actuation.

FRONT AXLE: Mack, heavy-duty, drop-forged I-beam.

REAR AXLE: Mack Planidrive, with final reduction through planetary gears within wheel hubs.

BRAKES: Full air, with 12 cu. ft. compressor.

FRAME: Alloy-steel, wide flange I-beam.

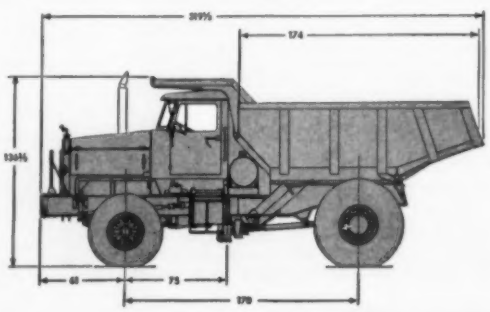
SPRINGS: Front, semi-elliptic with Rubber Shock Insulator suspension; rear, progressive-rate semi-elliptic with cam face slipper ends and radius rod.

TIRES: Front, 14.00-24 (16P) rib or 14.00-24 (20P) rib; rear, 18.00-25 (24P) lug.

WHEELS: Cast, spoked.

STEERING: Hydraulic power-steering, 62′ turning circle diameter.

DUMP HOIST: Twin, double-acting, outboard-mounted, three-section telescopic cylinder assembly, providing 70° dumping angle.



EXCAVATING. . .FILLING. . .EQUIPMENT HAULING . . .AGGREGATE AND

construction job...rugged or routine

MACK B-80 SERIES TRUCKS and TRACTORS

Here's Mack profit-power personified! There are B-80 tractors for heavy-duty hauling of platform or dump trailers . . . B-80 truck chassis for dumper, mixer or utility service. B-80's are powered with 170 to 232 hp Mack gasoline or diesel engines, or with Cummins diesels from 220 to 320 hp. Choice of Mack transmissions up to 20-speed Quadruplex. Powerful, rugged braking power. Available in four- or six-wheel models including six-wheel-drive units. Option of power steering.

CONDENSED SPECIFICATIONS

PAYLOADS: Rear dumper, 7 to 13 cubic yards or as mixers, 7½ to 8½ cubic yards (larger dumpers or mixers may require special provision).

ENGINES: Gasoline: Mack Thermodyne, 232 hp. Diesel: Mack Thermodyne, 170 hp; 205 hp, with turbocharger. Cummins, 220 hp; 320 hp with supercharger.

TRANSMISSIONS: Mack: Five-speed, direct or overgeared. Ten-speed (two-lever) Duplex. Twenty-speed Quadruplex. Availability contingent upon chassis models.

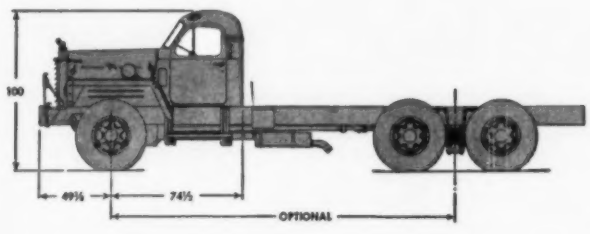
FRONT AXLE: Mack, heavy-duty, drop-forged I-beam. Mack, front-wheel-drive, for 6x6 chassis.

REAR AXLES: Four-wheelers: Mack Dual Reduction, with radius rods and torque arms. Six-wheelers: Mack Balanced Bogie, Dual Reduction, through-drive, inter-axle Mack Power Divider.

FRAME: Channel: Alloy-steel, heat-treated; channel reinforcement, standard.

TIRES: Available sizes and types: 11.00-24, 12.00-24 (Four-wheeler); 11.00-22, 11.00-24, 12.00-24 (Six-wheeler). Size availability contingent upon bogie.

STEERING: Hydraulic power-steering (optional extra).



Only MACKS offer all these profit-power features

Quality that can't be measured by specifications. "Specs" only tell half the Mack story. Mack on-the-job records tell the rest. For over half a century, Macks have out-earned, outworked and outlasted any other make of truck on demanding jobs. That's because every Mack starts with the most advanced design and the most durable materials . . . is built to the highest standards of strength and precision . . . is tested through every stage of construction.

Trucks and tractors for every construction job. As dumpers, mixers, tractors or platform trucks, dependable, economical Macks are engineered *right* for every important construction task.

Widest choice of engines. Mack offers a complete range of proved truck engines: Mack gasoline engines at 150 hp . . . Mack Thermodyne® diesel, Mack gasoline or stock diesel engines from 170 to 450 hp.

Super-capacity and all-wheel-drive models. For capacities up to 40 tons where maximum flotation is required, a full line of tandem rear-axle Macks is available. For utmost traction, Mack front-wheel-drive assemblies offer you four wheelers with four-wheel drive and six wheelers with six-wheel drive—models that can move heavy loads over any surface that will support a truck.

Parts and service wherever you operate. Mack owners everywhere have complete parts-and-service coverage. Your nearby Mack branch or distributor carries *nearly* any part you'll need on the job . . . and behind them are Mack parts depots that can ship out *any* replacement part at a moment's notice.

For capacities of 30 tons or more where maximum flotation is required, a full line of tandem rear axle Macks is available.

MATERIALS HAULING . . .CONCRETE, DRY-MIX AND ASPHALT HAULING

MACKS...stock or custom

MACK B-60 SERIES TRUCKS and TRACTORS

As dumpers, mixers, tractors and platform trucks, Mack B-60's have hung up records for economy on every kind of job. The "workhorse of the industry," they're powered with Mack Thermodyne gasoline or diesel engines from 170 to 205 hp. Four- and six-wheelers. Six-wheel models feature the exclusive Mack Balanced Bogie with Power Divider for non-spin traction through mud, loose gravel or sand. Longest mileage life in its class.

CONDENSED SPECIFICATIONS

PAYLOADS: Rear dumper, 6 to 12 cubic yards or as mixers, 5½ to 7½ cubic yards (with options).

ENGINES: Gasoline: Mack Thermodyne, 185 hp. Diesel: Mack Thermodyne, 170 hp; 205 hp with turbocharger.

TRANSMISSIONS: Mack: Five-speed, direct. Ten-speed (two-lever) Duplex. Twenty-speed Quadruplex. Ten- and twenty-speeds both on- and off-highway types. Availability contingent upon chassis models.

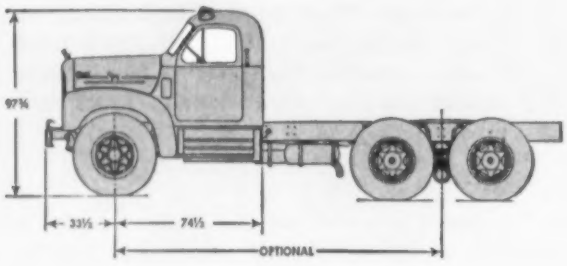
FRONT AXLES: Mack, heavy-duty, drop-forged I-beam. Three available sizes.

REAR AXLES: Four-wheelers: Mack Dual Reduction—with radius rods and torque arms. Six-wheelers: Mack Balanced Bogie, Dual Reduction, through-drive, inter-axle Mack Power Divider. Three bogie sizes available.

FRAME: Channel: Alloy-steel, heat-treated, pressed; channel reinforcements for maximum services (standard or optional extra).

TIRES: Available sizes and types: 11.00-24, 12.00-24 (Four-wheeler). 10.00-20, 10.00-22, 11.00-20, 11.00-22, 11.00-24 (Six-wheeler). Size availability contingent upon bogies required.

STEERING: Hydraulic-power type (optional extra).



MACK B-40 SERIES TRUCKS and TRACTORS

With big-truck capacity and stamina . . . with small-truck agility and economy . . . Mack B-40's are always in demand as dumpers, tractors, mixers and platform trucks. Mack Magnadyne gasoline engines develop 150 hp at low, life-prolonging engine speeds. Mack transmissions up to 20-speed "Quads." Four-wheel models and six-wheelers with Balanced Bogie with Power Divider. All-wheel-drive models, as well. Like all Macks, B-40's are engineered, built and tested with one objective: sure-fire performance on rugged jobs over long periods of time.

CONDENSED SPECIFICATIONS

PAYLOADS: Rear dumper, 5 to 10 cubic yards or as mixers, 5½ to 6 cubic yards (with options).

ENGINE: Gasoline: Mack Magnadyne, 150 hp.

TRANSMISSIONS: Mack: Five-speed, direct. Ten-speed two-lever Duplex. Twenty-speed Quadruplex. Ten- and twenty-speed, both on- and off-highway types. Availability contingent upon chassis models.

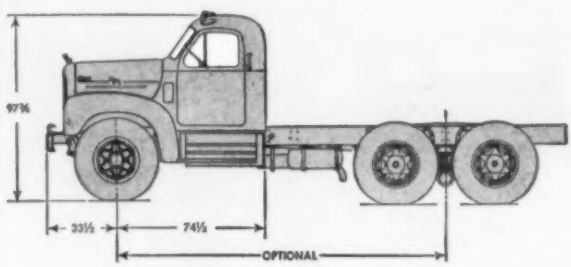
FRONT AXLES: Mack, heavy-duty, drop-forged I-beam. Four sizes. Mack, front-wheel drive (for 6x6 chassis).

REAR AXLES: Four-wheelers: Mack Dual Reduction. Six-wheeler Bogie: Mack Balanced Bogie, Dual Reduction, through-drive, inter-axle Mack Power Divider.

FRAME: Channel: Alloy-steel, heat-treated, pressed; appropriate inside-channel reinforcement (standard or optional extra).

TIRES: Available sizes and types: 10.00-20, 11.00-20, 11.00-22 (Four-wheeler). 8.25-20, 9.00-20, 10.00-20, 10.00-22, 11.00-20 (Six-wheeler). Availability contingent upon chassis.

STEERING: Hydraulic power-steering (optional extra).



EXCAVATING. . .FILLING. . .EQUIPMENT HAULING. . .AGGREGATE AND

built...for your specific job

Here's how MACK custom assembles the truck to fit your job

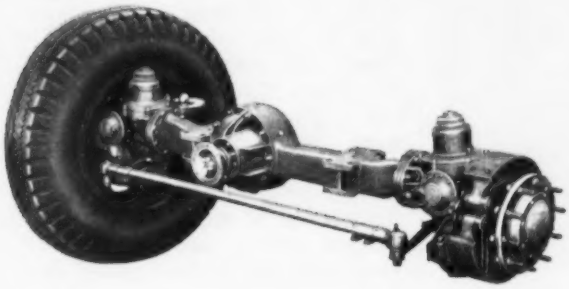
Mack builds every major component in a wide range of capacities ranging through super-duty. So—

Whatever kind of operation you have . . . whatever loads you haul . . . whatever problems you face by way of terrain, climate or grades . . . we can select the interchangeable, Mack-built components that meet these conditions and custom assemble them into the most efficient truck you can buy. (Stock models available too, of course.)

And only Mack offers quality features like these—

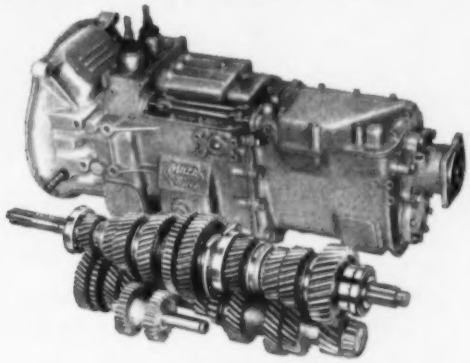
THE STRENGTH OF MACK-BUILT FRONT AXLES

Mack's drop-forged I-beam front axles are made super strong for long, trouble-free service. Extensive use of heat-treated steels for crucial parts means minimum maintenance. And Mack's exclusive *front-drive axle* for all-wheel-drive trucks offer the greatest ground clearance and strength of any made—with all parts fully enclosed.



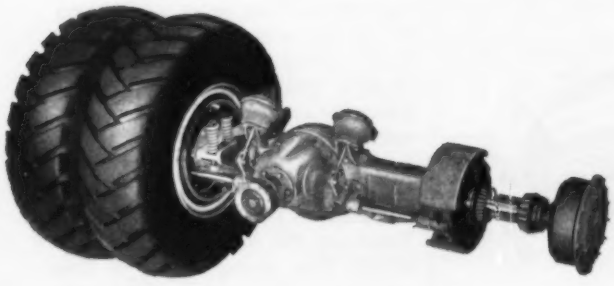
THE LONG LIFE OF MACK-BUILT TRANSMISSIONS

Service records prove that Mack transmissions—like this 20-speed Quadruplex—stand up to heavy-duty hauling far longer and need less attention than any others—thanks to the use of the finest gear metals known . . . to painstaking precision manufacture . . . and to exclusive Tetrapoid gear design that gives maximum strength, longer life and smoother action. Five- to twenty-speed units, each with ideal ratio steps.



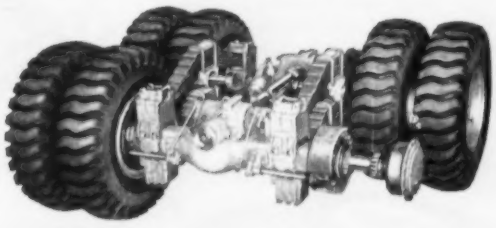
THE DURABILITY OF MACK-BUILT 2-WHEEL REAR AXLES

Mack's two-wheel, rear-axle assemblies have an unmatched reputation for service under strenuous conditions. Dual Reduction, gear-type differential and Mack's famous planetary gear reduction at the wheel hubs (Planidrive) provide the smooth distribution of power vital to top truck performance.



THE TRACTION OF MACK-BUILT BALANCED BOGIES

Macks perform where other trucks bog down—in mud, loose gravel or sand—thanks to Mack's exclusive Balanced Bogie with Power Divider. It's a 4-wheel-drive, tandem rear-axle assembly with an inter-axle differential that directs the most power to the wheels having greater traction. Planidrive final reduction in all four hubs eliminates the need for bulky carriers, differentials or axle shafts. Clearance is increased, weight is reduced, maintenance is fast and simple.

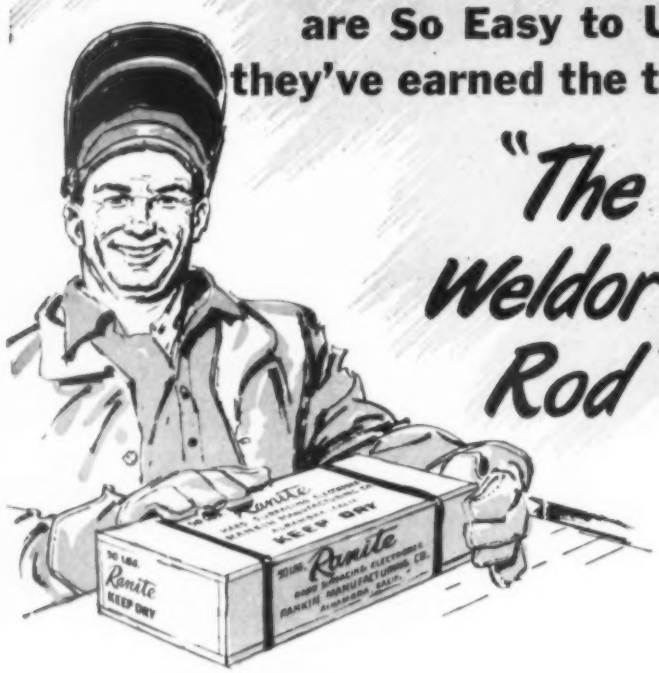


MACK *first name for* **TRUCKS**

Mack Trucks, Inc., Plainfield, New Jersey • In Canada: Mack Trucks of Canada, Ltd.

MATERIALS HAULING. . .CONCRETE, DRY-MIX AND ASPHALT HAULING

Ranite Hardsurfacing Rods are So Easy to Use they've earned the title, "The Weldor's Rod"



NINE ADVANTAGES combine to make Ranite metallic-coated rods easiest to use:

1. Operation is equally good on AC and DC machines.
2. Application is practical in *all positions*—including vertical and overhead!
3. Arc is very quiet and stable.
4. Loss from splatter is eliminated.
5. There is no slag to remove.
6. Clear welding vision is maintained.
7. Arc can be re-struck instantly, if broken, because of metallic coating.
8. Rapid deposition rate gets the work done fast.
9. Latitude is very broad—just five Ranite rods—A, BX, C, D and No. 4—handle the *great majority* of all jobs—makes selection quick and easy! (Other Ranite rods available to meet every requirement.)

GET FREE Ranite Select-O-Graph Guide—shirt pocket size—shows best rod to meet any wear condition. Ask your Ranite representative or write direct.

Originators and pioneers of metallic-coated rods—since 1938.

Ranite
WELDORS' NO. 1 CHOICE FOR HARDSURFACING

RANKIN MANUFACTURING CO.
616 So. Marengo Ave., P. O. Box 631
Alhambra, Calif.

Enter 122 on card, page 139

Contract Drilling, Blasting

(*From page* 117)

Drilling equipment employed by Rowe consists of a wide range of sizes, with particular emphasis on the heavy TM 500 tractor-mounted Joy for quarry drilling. Excellent drilling speeds are maintained with this model, using 2-in. drill rods, 4-in. Joy or Timken carbide bits with 20-ft. and 10-ft. steel changes permitting penetration to the desired depth.

The flexibility of such drilling equipment, available by fast trailer from Rowe's home base at Malden, Mass., makes this a popular service with quarries in many parts of New England.

Still another growing branch of Rowe operations is its program of highway rock drilling and blasting in various New England states.

As federal highway funds boost the road construction program in New England, Rowe's various pieces of equipment are moving rock in both urban (Worcester, Mass.) and rural (Grantham, N. H.) areas. Here again, close attention is given to good public relations. Blasting operations, wherever they may be conducted, are never popular with the public. A combination of pre-inspection and frequent seismic recordings, however, serve to keep Rowe posted on local conditions before and after shooting. Sometimes this is hard to do, as in the case of a bakery. Immediately after a shot made by the company the bakery proprietor telephoned that his oven doors had been sprung open and that all the day's bakery goods had fallen!

Rowe management is most optimistic about the future, believing that the next ten years will witness a vast expansion of the New England highway pattern, and that new regions, which were hitherto relatively inaccessible will be opened to volume travel.

Eastern Lime Corporation of Kutztown, Pa., has acquired Harlem Black Top Incorporated, a firm which operates plants in four areas of Pennsylvania. Eastern Lime reported a 54 percent increase in net sales and a 51 percent rise in net income for the first nine months of 1958.

COATES
INVITES
COMPARISON
440 C stainless, 52-54 Rc
Cast alloy white iron, 59-60 Rc
Gas carburized 5165 steel, 61 Rc
Coates forged 1095 steel balls
1060 steel, 63 Rc
Cast white iron, 49-50 Rc
440 C, 31-33 Rc
Gas carburized 5165 steel, 24 Rc
WEAR RATE, GR/DAY/SQ. IN.
WEAR RATES ON GRINDING BALLS FOR WET GRINDING OF CEMENT
COATES INVITES COMPARISON . . . Get the results of our studies of grinding-ball wear. Write Coates today for detailed research data. Make your own test . . . it can prove a profit opportunity for you.

Now prove in your own plant the efficiency, plus substantial savings offered by rugged Coates Carbex Grinding Balls. Make the same test we recently concluded in our continuing research to improve our product. A revolutionary new scientific technique was used to accurately identify balls with invisible markings. Several types of balls were marked and charged into a cement finishing mill. After thousands of gruelling hours, 98 per cent of the test balls were recovered. Laboratory examinations disclosed that Carbex Grinding Balls showed little wear, and on a true cost basis were a much better buy that balls which performed slightly better but cost ten to twenty times more.

Continuing research conducted by Coates has developed a low cost, high performance product. Carbex Triple-Forged Grinding Balls are rounder for better wear, harder for more efficient grinding, tougher to withstand stress. Grind better for less with Carbex Balls, proven your best buy.

CS58-3

Write for prices . . . All sizes—½" to 5" carried in stock for immediate shipment.

COATES STEEL PRODUCTS CO. CARBEX TRIPLE-FORGED BALLS

COATES STEEL PRODUCTS CO.

GREENVILLE, ILLINOIS

LARGEST EXCLUSIVE MANUFACTURER OF GRINDING MEDIA

Protection with Gulf products pays off in maintenance

GULF MAKES THINGS

At its new Pomona Quarry near Guilford College, N.C., Superior Stone Co. has about $300,000 worth of heavy equipment including a bulldozer, air compressor, power shovels, crushers, the usual assortment of towers and conveyor belts—and 4 brand new Euclid dump trucks.

"I'm especially interested in the maintenance of the Eucs, because they're new, and because they do such brutal work," said Mr. Williams, Pomona Quarry Superintendent. "They carry about 23 tons of granite, up a 35% grade about every 15 minutes, 7½ hours a day. And they work in clouds of fine granite dust that even gets past a good filter."

So, with special emphasis on the Eucs, Gulf made a comprehensive survey of all equipment. A consolidated fuel and lubrication chart was drawn up, reducing the number of fuels, oils and greases required—in line with manufacturers' specifications. This not only insured proper fueling and lubrication, it also simplified purchasing and stockpiling.

For the hard-working Euc engines, Gulf recommended high-detergency Gulflube Motor Oil X.H.D. and Gulf Dieselect—a fuel especially formulated for heavy duty diesel engine service.

After 15 months of tough service, and 2,100 hours of operation, the Euclid truck engines were examined by Mr. Williams. "Everything was clean," he said. "Almost no engine deposits. Only a minimum of sludge. Exhaust ports not clogged up. The program recommended by Gulf is paying off in every respect. It's helping us amortize our expensive equipment."

Up, over and into the hopper go some 20 tons of granite, being unloaded here by one of the hard-working Eucs at Pomona Quarry. Engines showed no harmful deposits after 2100 hours on Gulf Dieselect fuel and Gulflube Motor Oil X.H.D.

Pomona Quarry of Superior Stone, near Guilford College, N. C. Superior Stone, headquartered in Raleigh, N. C., works a number of quarries in both Carolinas and Georgia. All powered equipment operates on Gulf fuels and lubricants.

savings at new quarry . . .

RUN BETTER!

How's *your* equipment doing—on maintenance and performance? See how Gulf makes things run better. Just call a Gulf Sales Engineer at your nearest Gulf office. Meanwhile, write for 88-page "Contractors' Guide"—the maintenance "bible" for heavy equipment.

GULF OIL CORPORATION
Dept. DM, Gulf Building,
Pittsburgh 30, Pa.

GULF

Marion Williams, left, Superintendent of Superior Stone's Pomona Quarry, discusses his fuel and oil preventive maintenance program with Julian Lanier, Gulf Sales Engineer.

Enter 124 on card, page 139

changing personal or business circumstances, a rise or decline in earnings may cause you to

amend your declaration of

By HAROLD J. ASHE

FEW business taxpayers can come even close to approximating the amount of their income tax for the year at its beginning. Yet they are obliged to do so by April 15 of the tax year if their estimated gross income for the year exceeds $600 multiplied by the number of their exemptions plus $400. Innumerable circumstances, some beyond the taxpayer's control or ability to foresee, may have a major impact on his adjusted gross income during the year.

Some businessmen complain bitterly about the difficulty in filing a realistic declaration of estimated income tax. Nevertheless, once the initial estimate is filed, few taxpayers avail themselves of their right periodically to amend their income tax estimate as the year progresses. They methodically make quarterly remittances through the year on the basis of their original income tax estimate.

The result: some taxpayers remit far too little through quarterly installments, with the result that an income tax penalty maybe assessed against them. (Exception: A penalty may be avoided if the 1959 estimate is based on the previous year's income, provided that it was for 12 months, and is adjusted only to take into account changes in personal exemptions.)

Other taxpayers may remit in installments far more than their final income tax bill. In that event, they have penalized themselves because of the loss of the use of funds represented by the overpayment. It may be months after filing their annual income tax return before they can get a refund. (Overpayment, of course, can be applied to the new year's estimate at the taxpayer's option; but until such election the government has had the use of the overpayment). Some taxpayers may be cramped for cash because of overpayment of their income tax. In fact, the overpayment comes about because earnings are lower than estimated or due to heavier personal outlays of a deductible nature, or both.

Thus, for one reason or another, it may be advisable to amend a declaration of estimated income tax at least once during the year, or even more often. Some shrewd taxpayers review their changing circumstances before making each quarterly income tax remittance. If the facts warrant, they do not hesitate to file an amended estimate.

In preparing an amended estimate, the taxpayer should insert the word "amended" on the quarterly billing sent by Internal Revenue Service, or on a form 1040-ES. In filing an amended estimate, he should deduct the amount paid on the earlier remittance date (or dates) from the new estimated income tax. The remaining unpaid balance, if not then remitted in full, must be paid in equal installments on the remaining payment dates. Successive filing dates, after making the original estimate on or before April 15, are June 15, September 15 and January 15 of the following year.

You May Have to Pay More

What are some of the situations and circumstances which will necessitate amending an income tax estimate upward? Here are a few.

Increase in business earnings—As the year progresses, a substantial increase in gross receipts may sharply increase net earnings. Fact worth remembering: because of many fixed items of expense, *net* earnings from a business will very likely increase at a faster rate than the increase in *gross* receipts.

Capital gains—If capital gains are taken subsequent to filing the initial estimate, this will result in an increase in the final tax bill.

Other income—Income from other sources may increase considerably above original estimates, such as that resulting from extra dividends. Rental income may increase. A long vacant property, not considered as an income source, may be rented, creating additional and fully taxable income.

Windfalls—Income from unexpected sources, such as winning a contest, a lottery, or a similar event, will warrant an amendment upward of an income tax estimate if a substantial sum of money is involved. If prizes or awards are in services or merchandise, fair market value must be reported as income.

Marital status—Loss of the right to file a joint return may alter and increase the income tax bill. Filing of a joint return might have resulted in income being taxed at a lower tax bracket rate. A taxpayer is con-

estimated income tax

sidered single for income tax purposes if he was divorced by a final decree on or before the last day of his taxable year.

Loss of exemptions—An income tax bill will be materially increased by the loss of one or more exemptions during the year subsequent to filing the initial estimate. Each exemption lost will increase the final income tax bill by $120 or more, depending on the applicable tax bracket to which any income is exposed. Some taxpayers who, because of numerous exemptions, were not obliged to file a declaration of estimated income tax on April 15 may be required to do so later if they lose one or more exemptions during the year. (See opening paragraph).

Or You May Get a Break

Other circumstances and situations, some of them exactly the reverse of the foregoing, may warrant revising an income tax estimate downward. Here are some of the factors that may bring about a reduction in an income tax estimate.

Decrease in business earnings—Subsequent to filing the original estimate, net earnings may decline below those estimated. Even a small decline in gross receipts may have a seriously adverse effect on net earnings. Whatever the decline, percentage-wise, in *gross* receipts this will not usually indicate a similar percentage decline in *net* earnings. The latter will be much greater. Fixed items of expense run on, despite fluctuations in receipts.

Particularly worth noting is the effect on net earnings of a sole proprietorship, if the owner is seriously ill during the year, and therefore absent from his business. A large part of business earnings may be traceable to his personal services to the business. A serious illness may also alter his income tax obligation.

Capital loss—A capital loss, not offset by a gain, will result in a decreased income tax obligation.

Casualty loss—A casualty loss, not reimbursed by insurance proceeds, or not reimbursed to this extent, will reduce an income tax estimate. A non-business casualty loss may also reduce an income tax bill.

Acquisition of depreciable assets—If business machinery, equipment, or other assets of a depreciable nature are acquired during the year, subsequent to filing the initial estimate, this fact may substantially reduce a tax obligation. Business net earnings will be reduced by the exact amount of the allowable depreciation charge for the fractional part of the year applicable. Non-business assets of a depreciable character acquired for the production of income will have the same effect. Improvements to rental property would be a case in point. Repairs chargeable to a business or income-producing property will also reduce an income tax obligation.

Marriage—If a taxpayer marries during the year and remains married at the year-end, this fact will entitle him to file a joint income tax return. If his adjusted gross income is taxable above the lowest tax bracket rate, a joint return will usually reduce his income tax return. Note this exception: if his wife has an adjusted gross income as great as his, or greater than his, filing a joint return may offer no tax advantage.

New exemptions—Subsequent to filing his original estimate, a taxpayer may acquire an additional dependent or dependents, through birth or adoption. Or he may undertake to contribute to the support of certain relatives. If these dependents otherwise qualify legally, each additional exemption will reduce his income tax bill by at least $120.

Special exemptions—Each spouse (but no dependent) who reaches age 65 at any time during the year is entitled to an additional $600 exemption. Likewise, if either spouse becomes blind, by legal definition, during the year and is blind at the year-end, this results in another exemption. Such an additional exemption or exemptions created subsequent to filing the initial tax estimate may eliminate further quarterly payments if payments already equal or exceed the new estimated income tax.

Personal deductions—Serious illness or other unforeseen events may sharply increase the amount of personal deductions. Acquisition of a mortgaged home with heavy interest charges and property taxes may materially increase the total personal deductions or exceed the standard deduction used as a basis for making the initial income tax estimate.

Operation of Alexco Aggregates, Incorporated, near St. Louis Park, Minn. The plant is a fully portable, diesel-electric setup.

Centralized Control, Diesel-Electric Power

A FULLY portable and highly efficient crushing and screening plant is producing up to 400 tons of sized sand and gravel per hour for a Minnesota pit.

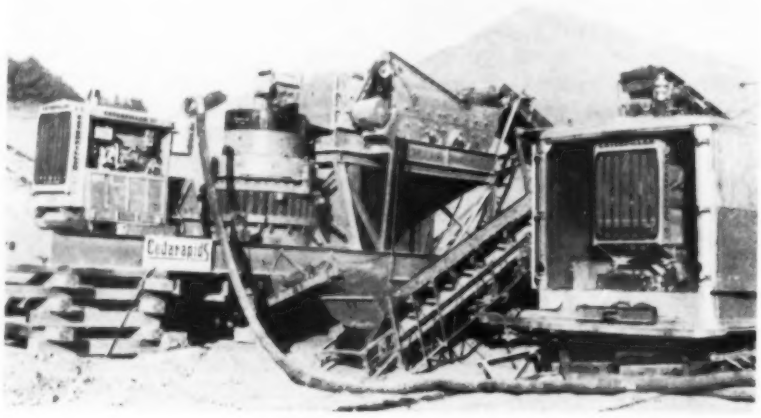
Located at St. Louis Park, near Minneapolis, this smooth-running plant is owned and operated by Alexco Aggregates, Inc. The firm supplies contractors, governmental agencies, and small paving contractors in the area. The larger part of its output is used for bituminous and base course aggregate, although a variety of related materials are also sold.

Overburden covering the 18-acre glacial deposit is between 1 and 2 ft. deep. Two Cat D8 Tractors equipped with U-Dozers strip the topsoil and push the raw gravel 300 ft. (maximum) into a 15- by 15-ft. trap. Occasional clay pockets are removed or by-passed. One of the D8's is also used occasionally to stockpile the product.

At the trap, located just above the crushing plant, a Simplicity vibrator-type grizzly feeds a 42-in. heavy-duty conveyor. Material then flows to a second grizzly, which retains all material over 19 in. in diameter. This large rock is marketed as riprap. Gravel is then fed into a 22- by 36-in. Cedarapids triple-deck vibrator screen, where it is sized. Product ranges from 4-in. plus on the scalper to 1½-in. minus on the bottom deck. Middle screens grade to ¾-in. and ⅝-in. minus.

Since production currently requires 35-40 percent crushing, a closed circuit recycles material for secondary crushing in a Nordberg-Symons 4-ft. cone crusher.

The entire operation, from trap through stockpile, is electrically powered and all conveyors, screens, and crushing units are controlled from a central panel. Flexibility of the plant's design permits the operator to regulate the speed of the



The crushing and screening plant site. Note the van-mounted diesel-electric set (right). The hose running to the electric set (left) leads to a special remotely-mounted air cleaner.

Loading a tandem dump truck with tractor-mounted loader equipped with a side-dump bucket. This special bucket enables the unit to load with the minimum of turning, a feature which greatly reduces cycle time and increases efficiency.

Featured in Portable Minnesota Gravel Plant

conveyors in relation to the production speed of the crushers and screens. This advantage, combined with the portability of the machinery, provides an efficiency seldom attained in other systems.

As crusher production is increased to meet demand, conveyors can be speeded up to handle output. When stockpiles have been filled, the conveyors can be easily moved to other locations without complicated changes. Production averages 3,000 t.p.d.

All electricity is obtained from portable electric sets. A Caterpillar D318 generating set powers the feeder hopper and primary conveyor, while a Cat D339 furnishes power to the primary crusher. Screening plant and stockpiling conveyors are run from current supplied by Cat D326 electric set. The secondary crusher is powered by a Cat D337. Two of the generating units, the D337 and the D318 are van-mounted.

Although Alexco has a 15-cu. yd. rear-dump tractor-trailer and a tandem dump, the bulk of the company's production is hauled by privately-owned vehicles.

Mainstay of the firm's loaders is a Cat No. 977 Traxcavator with a side-dumping bucket. The machine easily loads a 6-cu. yd. truck in less than a minute. Cycle time is greatly reduced by the side-dumping bucket. This feature permits the Traxcavator to load a truck in a straight line without turning. When it is not loading trucks, the No. 977 is used with the D8 in stockpiling and feeding the hopper.

A Pettibone-Mulliken rubber-tired loader is used for clean-up and general utility work. Lifting and some loading is handled by a Lorain crane with ½-cu. yd. clamshell and dragline buckets.

Alexco's 15-man crew works 10 hours per day, six days per week. Bill Alexander is president of the company. Bill Grimme is superintendent and vice-president; and Don Ashworth is sales manager.

Bill Grimme (left), general superintendent and vice-president of Alexco Aggregates, and Don Ashworth (right), sales manager, at the company's operation near St. Louis Park, Minn.

A 50-ton-per-day (metric) cement plant, located in Kaohsuing, Taiwan (Formosa), one of five such installations on the island.

Small Cement Plants in Taiwan

By T. Y. LEE

Taichang Industrial Corp., Taiwan

THE cement industry has long been recognized as the vital prerequisite to various industrial developments. There also have been indications that the potential of cement production is a most powerful assurance to the advancement of national defense and to the improvement of the living standards of a country. It has become axiomatic that any country in an advanced stage of industrial progress must possess a sizable cement industry.

In most of the industrially underdeveloped regions of Asia where the erection of cement plants is now beyond the capabilities of the nationals, and where production is scanty, the required cement must be imported from other countries. This involves large sums in foreign exchange and extremely high transportation charges. These expenses result in high cement prices which the people cannot afford.

In these adverse circumstances, local construction projects cannot be implemented to keep the process of industrialization at a desired pace, and consequently the anti-Communist potential is considerably reduced. Therefore, it is vital to aid the development of the cement industry in Asia and to see that it gets priority.

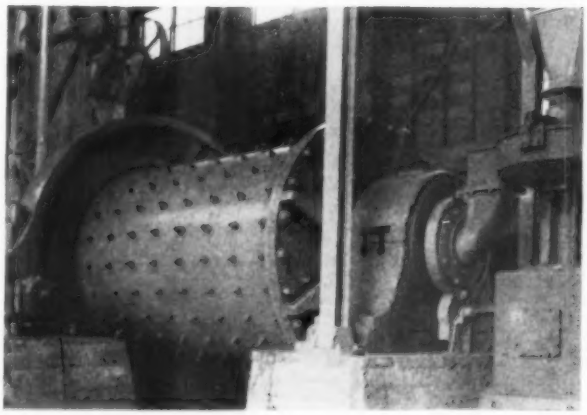
The required raw materials are all natural resources, obtainable locally almost anywhere in these regions, obviating the necessity of relying upon foreign countries. In consideration of the transportation handicaps and lack of technical know-how in such areas, projects of small decentralized cement plants are preferable, owing to these advantages:

1. Smaller capital investment is needed to establish such a plant.
2. Proximity of local material sources to markets avoids transportation difficulties.
3. Simple organization requires fewer technicians and workmen.
4. A shorter period of implementation eliminates stagnation of working capital.
5. Lower power demand cuts costs.
6. Machine parts can be made locally.

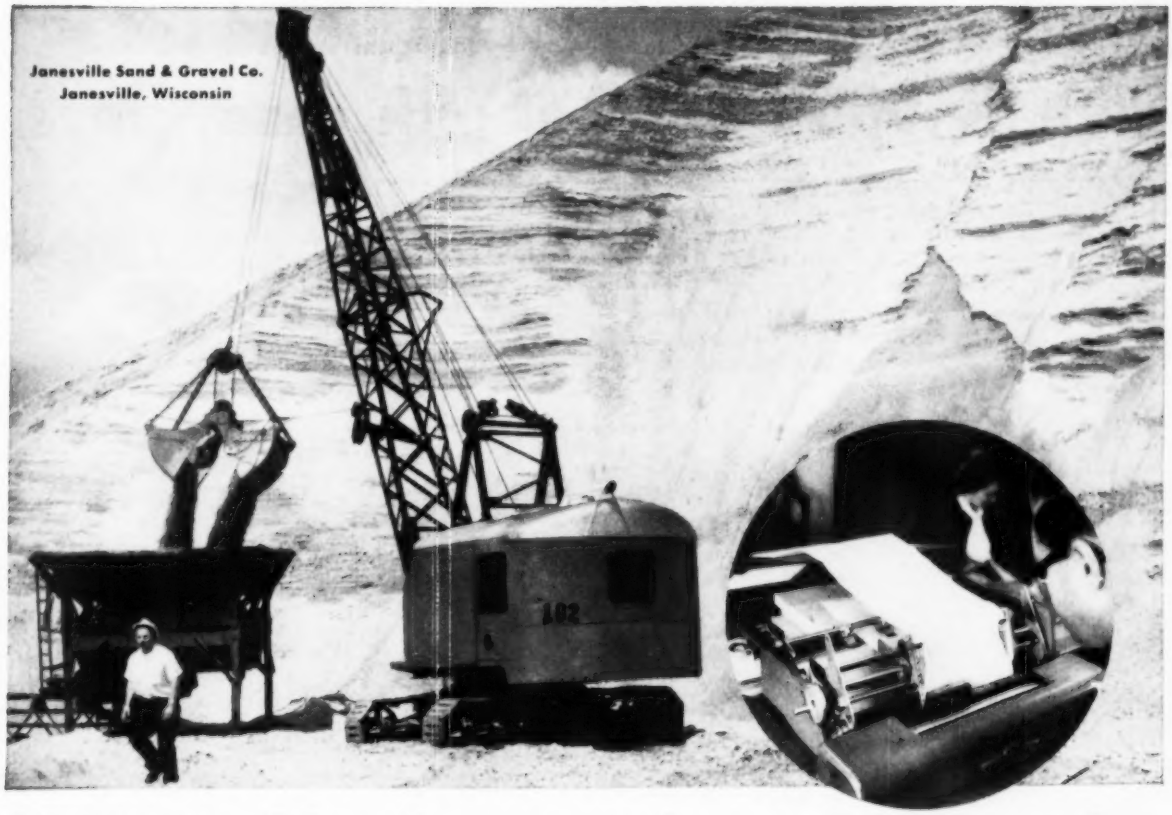
A small cement plant has been designed specifically for operation in the Far East. It will not only enable the investors to make good profits but will also promote an increasingly better standard of living and aid in maintaining sufficient anti-Communist strength.

Based upon the conditions as described, T. W. Johnston, an American, and the writer, T. Y. Lee, mechanical engineer, China, organized (1954) a Sino-American firm konwn as the Taichang Industrial Corporation, for the purpose of designing and installing a white cement pilot plant in Taiwan, (Formosa). The daily output of this plant is only 15 metric tons.

This facility has stimulated high interest in the industrial field and stepped up national progress. In a three-year period five small cement plants with capacities of 30 to 50 tons a day have been established and put into full-scale operation. These small plants have been able to stand firmly in competition with other larger cement producers. It is believed that the same type of plant is suitable for Korea and other undeveloped Asian countries.



This ball mill in one of the small Formosan cement plants is driven by a 60-hp. motor.



"IBM machine keeps maintenance records—Cities Service sets them!"

Janesville Sand & Gravel's IBM maintenance reports reveal superiority of Cities Service C-300 Motor Oil for all engines

Detailed and accurate records are one of the prime reasons behind the growth of Janesville Sand & Gravel to its present production of nearly 40,000 yards of concrete a year.

So it's not surprising to find Janesville pioneering the use of IBM equipment to keep absolutely precise maintenance records. Nor is it surprising that these records reveal exceptional performance for all 112 pieces of motorized equipment using Cities Service C-300 Motor Oil.

Probably the most versatile motor oil available, Cities Service C-300 is a "work-horse" lubricant ideally suited to gasolene engines in severe service and heavy duty diesels. Janesville finds it a particularly desirable motor oil because of its ability to provide maximum protection under heavy-load, low temperature start-stop operation.

If you'd like to simplify oil inventory . . . if you're anxious to arrest carbon, sludge, varnish, corrosion and the other profit robbers so familiar to start-stop operation . . . get the facts about Cities Service C-300 Motor Oil. Talk with a Cities Service Lubrication Engineer from the nearest office. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N.Y.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

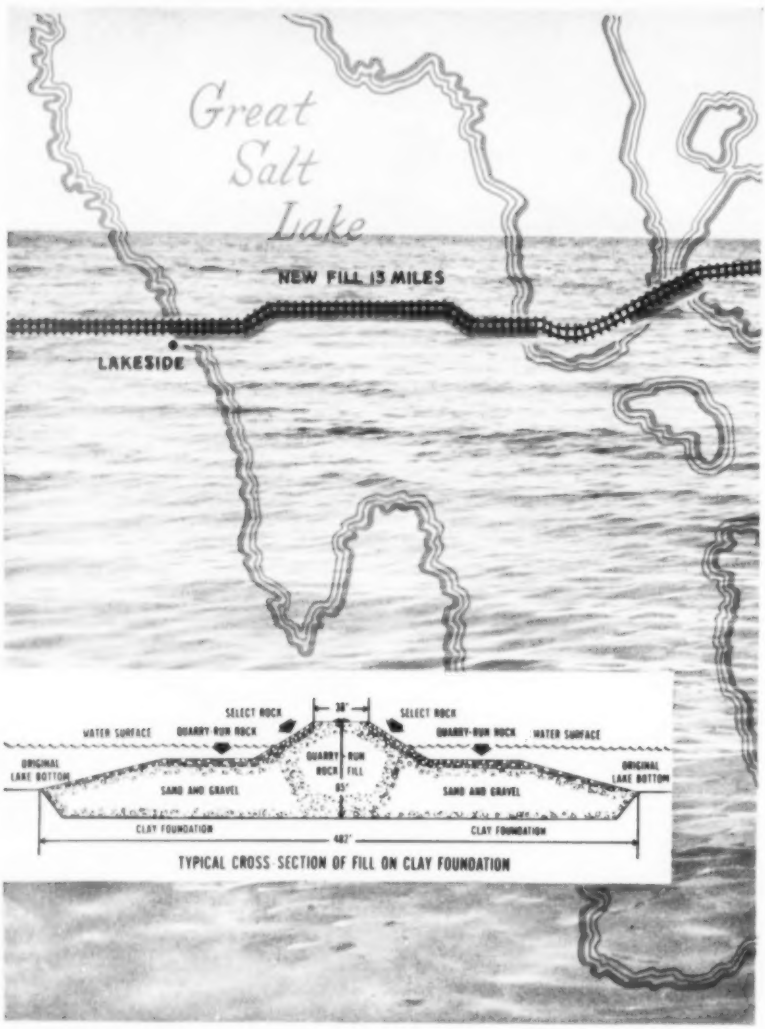
Radio Dispatched Trucks are typical of Janesville's efficient methods. Like all other motorized equipment, the trucks are lubricated with Cities Service C-300 Motor Oil, and the resulting outstanding performance is a matter of IBM record.

5-Million Cement Blocks A Year are manufactured at the Janesville plant. IBM records show excellent production efficiency. The firm has been noted for accurate records since its founding in 1907.

Enter 131 on card, page 139

Southern Pacific bridges an inland sea with 36,000,000 yd of rock, sand, gravel

Great Salt Lake, Utah—Take a mountain of rock, sand and gravel—36,000,000 yd of it... stretch it 12.6 miles with the help of the world's biggest tractor shovels ... then sink it 68 to 85 feet deep into Great Salt Lake. That's how the men of Morrison-Knudsen are building a new, solid-fill, deep-water, roadbed for Southern Pacific Railroad across Utah's great inland sea. Allis-Chalmers HD-21G tractor shovels play an important role in this gigantic undertaking.



Multi-million dollar job passes halfway mark

The monumental job, scheduled to finish in 1959, triggered some of the largest non-atomic blasts in history to supply fill material. One blast powered by 2,138,000 pounds of explosives yielded 3,700,000 cu yd of broken rock.

Most of the fill is being placed by a fleet of eleven barges loaded by two methods. One is a spectacular two-mile conveyor system said to be the world's largest in terms of tonnage moved—4,000 to 4,200 tons per hour.

4-yd HD-21G's work ashore and afloat

The second method is by trucks that dump directly to barges. This fleet of 17-yd dump trucks moves constantly from stockpiles adjoining railroad tracks to the barges on a 20-hour a day schedule. Much of the truck loading is handled by Allis-Chalmers tractor shovels, only tractor shovels on the job.

With characteristic versatility, the tractor shovels are also able to board the barges and help place

A-C ALLIS-CHALMERS

...move ahead with **ALLIS-CHALMERS**....

Giant 225-hp Allis-Chalmers HD-21G tractor shovels handle their share of the fabulous 36,000,000 cu yd of fill going into the causeway. Production on the job has hit as high as 100,000 cu yd in a single day.

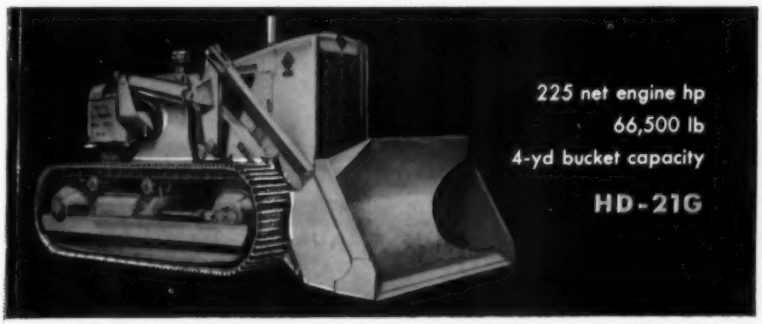
rock ballast on the causeway itself. If their loading ability is needed on the opposite shore, they are easily transported by barge or regularly-scheduled work train.

For a big job—big machines

Men talk about the Salt Lake Causeway job in superlatives. Big machines moving tonnage at a record-breaking pace. And the HD-21G's on-the-job advantages match it all the way: the *highest* lift and the *longest* reach—with the *biggest* load. From ground level, the 4-yd bucket dumps handily up to 13 ft, 4 in.—high enough to clear the sides of the biggest haulers.

Morrison-Knudsen keeps close service records of each machine on the job. Service logs for the HD-21G's show they put in maximum time—offer top availability to keep producing.

Here's actual proof on a heavy-duty tractor shovel operation that Allis-Chalmers maintenance and service cost is low—that you get more profit-making availability and production from your Allis-Chalmers equipment. Your Allis-Chalmers construction machinery dealer will demonstrate the size tractor shovel that fits *your* work—1½, 2¼, 3 or 4-yd capacity. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.



. power for a growing world

LONG OR SHORT HAUL. Barber-Greene Permanent Conveyors are available for every handling requirement. Write for 192-page catalog.

Move material faster – at lowest cost with Barber-Greene Belt Conveyors

Built of standardized components, Barber-Greene Permanent Conveyors are delivered and erected faster. They give top performance, yet require less engineering, and they are easily altered to meet changing or expanding requirements. Standardization also means readily available spare parts.

Barber-Greene Portable Conveyors handle all bulk materials. Pneumatic tires give fast travel between jobs. Swivel wheels allow building of high-capacity radial stockpiles. Line shaft and gear reducer drives eliminate troublesome chains and sprockets. Rugged construction assures long life and low maintenance. Lengths to 60 feet or more. Complete line of accessories.

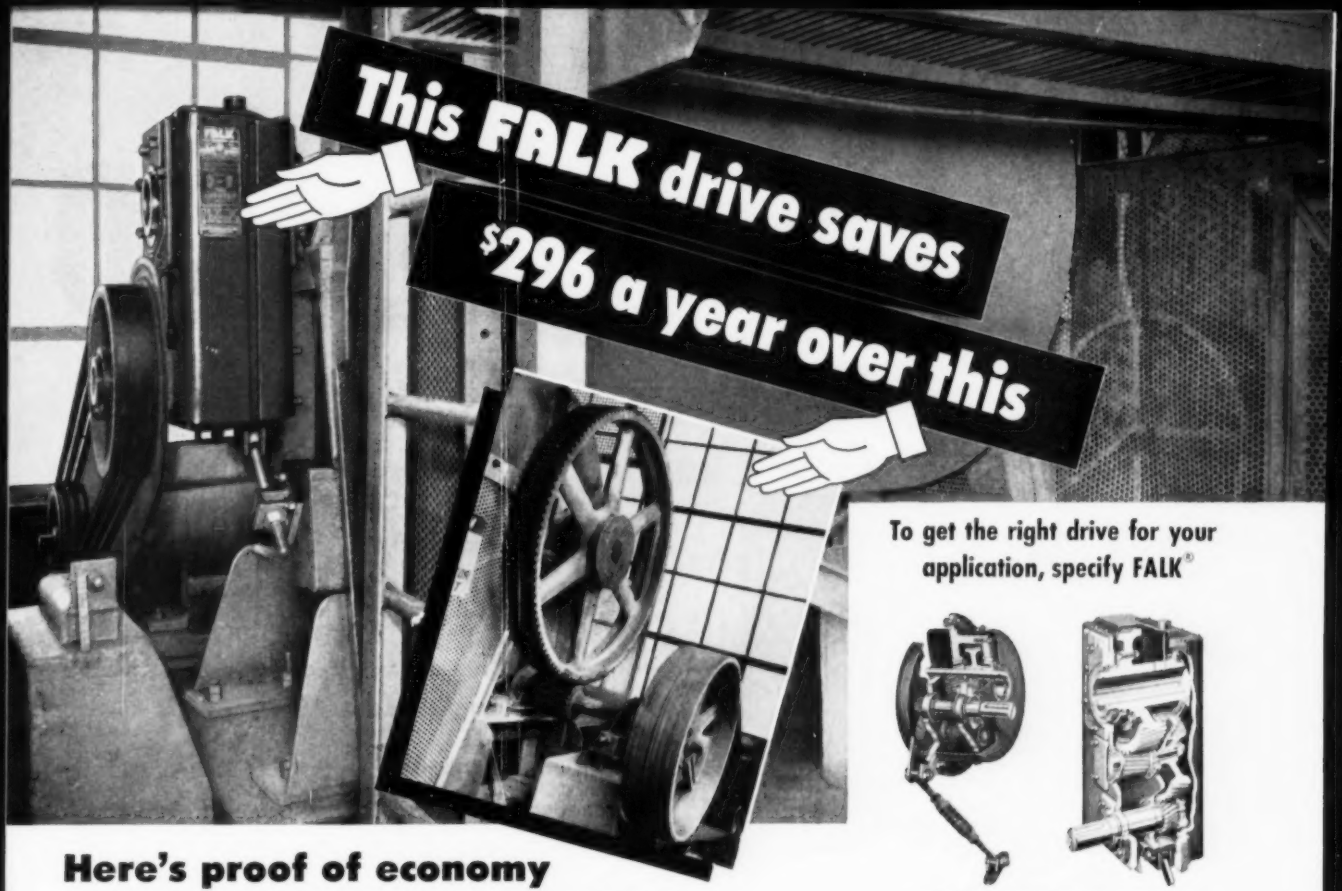
FASTEST UNLOADING AND STOCKPILING. Barber-Greene Portable Conveyors and Car Unloaders provide fastest, most economical method of unloading hopper cars to stockpile and trucks.

58-16-POE

Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT



Here's proof of economy with FALK Shaft Mounted Drives

PROBLEM—For many years, a prominent Eastern abrasives manufacturer* experienced high maintenance and down-time costs, as well as excessive noise and vibration, in the operation of 19 pebble mills driven by open spur gears. Drive gears and jack shaft pillow blocks required frequent repairs or replacement, and trunnion shafts often failed, due to radial overloading of the bull gear when broken pinion teeth bottomed between gear teeth.

SOLUTION—After numerous unsuccessful approaches to these problems, the solution was found by mounting a Size 315J FALK Shaft Mounted Drive directly on the mill drive trunnion. This eliminated objectionable gear noise and vibration...greatly reduced costly down-time and loss of production...and cut annual maintenance and replacement expenses as indicated by the following figures taken from the customer's records:

Spur Gear-and-Pinion Drive		FALK Shaft Mounted Drive	
Bull Gears	$ 56	VEE Belts	$ 30
Pinions	120	FALK Shaft Mounted Drive (based on 10-year life)	70
Pillow Blocks	90		
VEE Belts	30		
Trunnion (5-year life)	100		
Annual cost	$396	Annual cost	$100
		ANNUAL SAVINGS	$296

IF OBSOLETE DRIVES ARE COSTING YOU MONEY, a change to Falk All-Steel Shaft Mounted Drives can effect important savings in money and production. Used on almost any type of machine, these compact, rugged units are establishing new standards of economy and efficiency in many industries. Specify FALK Drives on your purchased equipment...For full details, **write for Bulletin 7100.**

*Name on request

THE FALK CORPORATION, MILWAUKEE 1, WISCONSIN

MANUFACTURERS OF QUALITY GEAR DRIVES AND FLEXIBLE SHAFT COUPLINGS

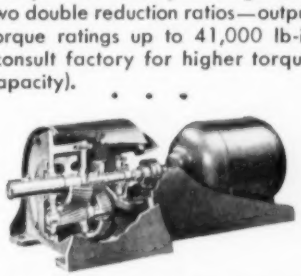
Representatives and Distributors in Most Principal Cities

To get the right drive for your application, specify FALK®

SHAFT MOUNTED DRIVES

Horizontal or vertical units—½ to 50 hp—420 to 5 rpm—single and two double reduction ratios—output torque ratings up to 41,000 lb-in (consult factory for higher torque capacity).

• • •



ALL-MOTOR® MOTOREDUCERS

Sizes up to 75 hp—furnished with or without standard foot-mounted motor—standard output speeds 1.2 to 520 rpm (with 1750 rpm motors)—ratios as high as 54,000:1 in semi-standard designs. Integral units (gearmotor type) also available. Ask for **Bulletin 3100.**

• • •

FALK Drives are available from factory and distributor stocks from coast to coast. Consult your Falk Representative or Distributor.

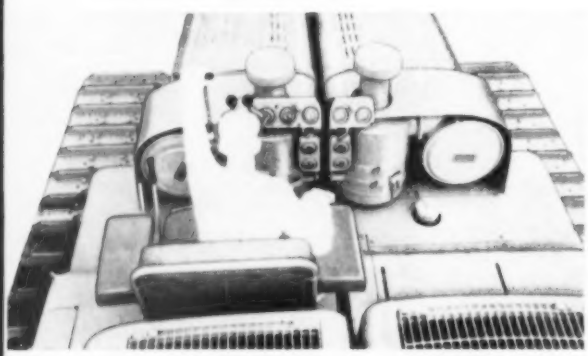
FALK

...a good name in industry

Tremendous power, quick maneuvering and on-the-go power shift cut valuable seconds from cycle times when the TC-12 is used for push-loading scrapers.

As a dozer, this Twin-powered Crawler provides unmatched work-ability because of its ease of handling, smooth push power and brute strength.

For heavy ripping work, you can count on unequalled drawbar pull and plenty of stability to do a really fast and thorough job.



With convenient, simplified controls, the TC-12 has no equal for operating ease—by keeping operator fatigue to a minimum, full shift efficiency can be maintained.

New Series EUCLID

Ever since the TC-12 was introduced, there has been no question about its top performance ability—even on the toughest crawler jobs. Now with over 3 years of field experience on practically every kind of operation, major product improvements make the new TC-12 better than ever.

Powered by two engines, there's a total of 402 net horsepower delivered to the power train through separate Torqmatic Drives for each track. Big 27" shoes and 8 rollers give the TC-12 good balance with or without heavy duty dozer blades and other mounted equipment. Bare weight of the tractor has been increased to 67,000 lbs. as a result of heavier construction and more rugged components throughout.

With independent track drives, there's no dead track drag when turning—maneuverability of the big TC-12 with its full power shift saves seconds on every cycle whether you're push loading scrapers, dozing or pulling big equipment. And with unitized assembly, good design of component location and equipment mountings, this "Euc" crawler provides easy accessibility for service and maintenance.

Have your Euclid dealer give you all the facts on the new TC-12 . . . you'll find it's your best buy by far where big tractor performance is needed.

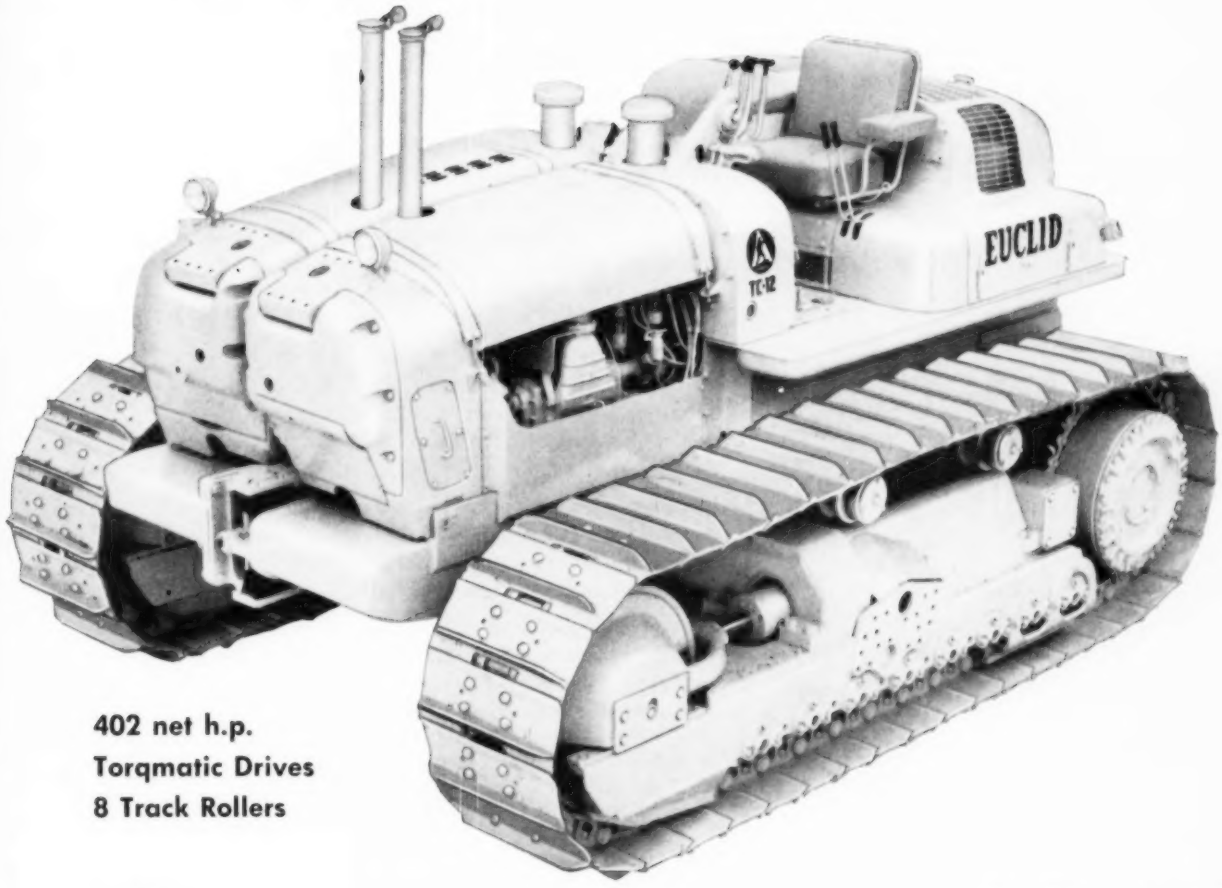
EUCLID DIVISION of GENERAL MOTORS, CLEVELAND 17, OHIO

TC-12 ...now even further ahead of other crawlers

in maneuverability . . . service accessibility . . .

in functional design . . .

and in work-ability



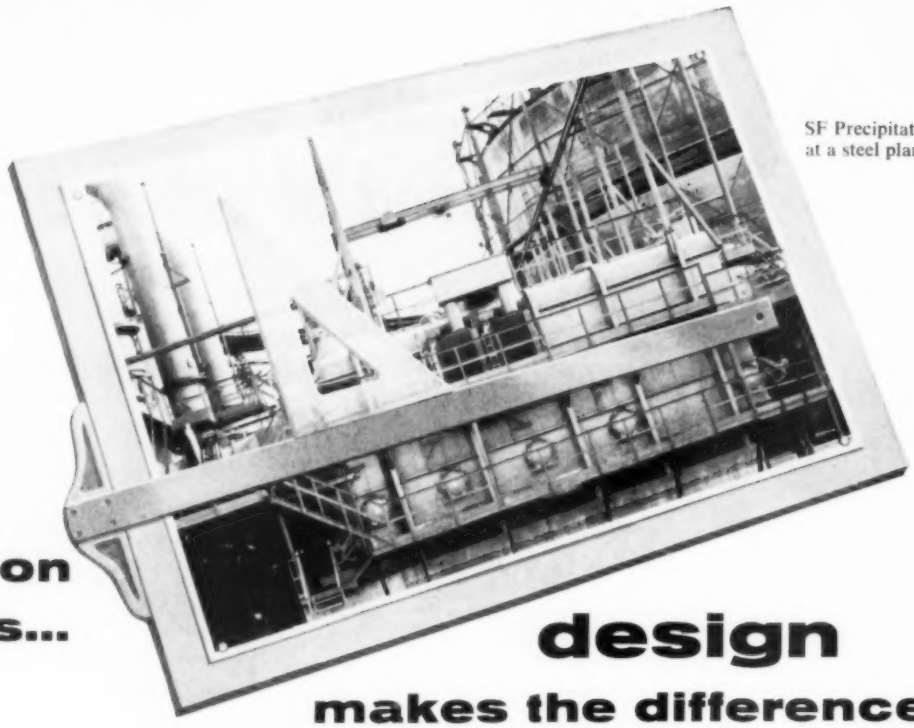
402 net h.p.
Torqmatic Drives
8 Track Rollers

Enter 136 on card, page 139

GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE



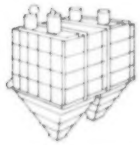
SF Precipitator at a steel plant.

In Dust Collection Systems... design makes the difference

Higher efficiency of Buell 'SF' Electric Precipitators is the result of exclusive engineering features. For example, Buell's *Spiralectrodes* emit 50% to 100% more electrons than other types . . . and *maintain* their efficiency. Positive gas flow control through adjustable baffles prevents scouring and eddying. And Buell's Unique Continuous Cycle Rapping practically eliminates "puffing".

BUELL CYCLONES

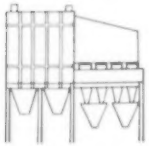
Lower installation cost of Buell's time-proved simplified design makes erection faster and easier. Spiralectrodes, for example, are self-tensioning, require no weights. Flexibility of power supply means easier installation, operating safety.



"SF" ELECTRIC PRECIPITATORS

Lower maintenance cost is the result of many details of superior design. And sectionalized design permits shutting down part of a unit without interrupting service in the rest of the unit.

Get full information: write for a copy of "Buell SF Electric Precipitators", a 22-page booklet. Write to Dept. 18-C, Buell Engineering Co., Inc., 123 William Street, New York 38, N. Y.



PRECIPITATOR-CYCLONE COMBINATIONS

buell®

Experts at delivering Extra Efficiency in **DUST COLLECTION SYSTEMS**

More Information, Please

Use postcard to obtain literature or details about equipment and products reported in this issue.

MECHANICAL DRAFT and other heavy-duty fans are described in a new bulletin from the *Buffalo Forge Company*. The bulletin includes basic data for proper fan selection, performance tables, design sketches, and component and installation photos of many types ranging from kiln fans to cyclone compressors. **(301)**

CRESCENT BELT FASTENER COMPANY, INC., has issued a brochure on its complete line of fasteners for joining or repairing conveyor, elevator, and transmission belting of any width or thickness. Featured is the Crescent repair kit, which contains 20 sizes of fastener plates and 150 rivets in assorted sizes. A selection chart shows the number of Crescent plates and rivets for conveyor belts of various widths and thicknesses. **(302)**

ENGINES in *Detroit Diesel's* new all-purpose power line are described in an illustrated brochure which gives power ratings and overall dimensions on over 100 in-line, "V", and turbopower engine models. This GM power line consists of single, multiple, and turbopowered units ranging from 20 to 1,650 hp. in only three cylinder sizes. **(303)**

EXPLOSIVES, BLASTING AGENTS, and blasting supplies available from the *Hercules Powder Company* are listed in an 82-page catalog. Included is a 2-page summary of the properties of Hercules explosives and an index to a complete description of each. **(304)**

A NEW ELECTRONIC METAL DETECTOR for rock crushing operations is detailed in literature published by the *Radio Corporation of America*. The unit detects all types of metal, both magnetic and non-magnetic. It mounts around a conveyor belt and when tramp metal is present, automatically sounds an alarm before the metal can reach the crusher. **(305)**

SERIES 10 JAW CRUSHERS, heavy-duty units designed primarily for gravel and secondary crushing, are detailed in Bulletin BM-10 from the *Gruendler Crusher & Pulverizer Company*. Specifications and capacities are given for models with 10- x 16-in., 10- x 20-in., 10- x 24-in., and 10- x 36-in. feed openings. **(306)**

A NEW INDEX OF INSTRUMENTATION LITERATURE lists all product, technical, and application literature published by the Industrial and Valve Division of the *Minneapolis-Honeywell Regulator Company*. An index of *Instrumentation* magazine articles is included, as well as a description of educational aids and other Honeywell services and literature. **(307)**

OFF-HIGHWAY CATALOG NO. 35, issued by *A. Schrader's Son,* covers large bore tire valves, tools, and air service fittings for off-the-highway tires. The large bore retains the same fundamental design of the standard tire valve, but permits faster inflation and deflation of large volume tires and is heavier in construction. **(308)**

THE BEAVER DIESEL-ELECTRIC DREDGE is described in Bulletin 776, issued by the *American Machine & Engineering Company*. The portable dredges are designed for easy assembly and disassembly and for one man operation. The 8-in. dredge size has an output of 80-130 cu. yd. per hour; the 10-in. size, 145-195 cu. yd. per hour; and the 12-in. size, 240-320 cu. yd. per hour. **(309)**

THE CHALLENGER LIME AND FERTILIZER SPREADER is featured in literature released by the *Highway Equipment Company*. The Challenger is a positive-feed, self-unloading lime and fertilizer spreader which offers either a single spinner with an 18-in. conveyor or twin spinners with a 24-in. conveyor. **(310)**

March ***PIT AND QUARRY*** **1959**

Insert key numbers found below items on advertising, literature, and new equipment pages. Print company name if not keyed.

VOID AFTER 60 DAYS

_____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

We Produce_____

FIRST CLASS
PERMIT NO. 44
CHICAGO, ILL.

BUSINESS REPLY CARD
No Postage Stamp Necessary if mailed in the United States

—POSTAGE WILL BE PAID BY—

Pit and Quarry Publications
431 South Dearborn Street
CHICAGO 5, ILL., U.S.A.

More Information, Please

Use postcard to obtain literature or details about equipment and products reported in this issue.

SPACE-SAVING V-BELT DRIVES which are smaller and lighter weight are covered in a 44-page bulletin prepared by the *Dodge Manufacturing Corporation.* Illustrated with photographs and engineering drawings, the bulletin explains construction features of new Dyna-V sheaves and V-belts. Tables give horsepower capacities, belt speeds, center distances, sheave diameters, etc. **(311)**

TWO NEW ANTI-FRICTION LUBRICANTS, said to have no melting or dropping point, are the subjects of a folder published by *The Whitmore Manufacturing Company.* The folder gives test data and performance characteristics for use in providing constant protection to roller, ball and sleeve bearings, or sliding surfaces in "hot" bearing applications or in areas with high ambient heat. **(312)**

INFORMATION ON SOLDERING ALUMINUM is presented in a new booklet from the *Reynolds Metals Company.* The reference includes data on soldering fluxes, irons and flames, and gives complete information on actual soldering methods. Types and properties of aluminum solders are explained, plus the corrosion of soldered joints and their performance in aluminum. **(313)**

INDUSTRIAL AND MINING LOCOMOTIVES are featured in a new brochure from the *Plymouth Locomotive Division, The Fate-Root-Heath Company.* Locomotives in the folder include latest 4- and 6-wheel cab-in-front models, compact Mine-o-motives, and heavy-duty tandems built to be operated individually or as a single unit by a single operator in either cab. **(314)**

MODEL R-27 REAR DUMP HAULER for mines and quarries is described in a catalog issued by the *Euclid Division, General Motors Corporation.* Cut-away views of major components and on-the-job pictures explain the engineering design of the 18-cu. yd. (struck) capacity unit. Specifications are included. **(315)**

SYMONS INTERMEDIATE CONE CRUSHERS, manufactured by the *Nordberg Manufacturing Company,* are featured in newly-revised Bulletin 236A, which includes a table of average capacities at various settings and feed openings and a cross-section of a 30-in. unit illustrating the principle features. **(316)**

ENFA REPLACEMENT BAGS for dust collection systems and replacement elements for wet filtration systems, available in a variety of natural or synthetic cloths, are pictured in a folder released by the *Engineered Fabrics Corporation.* **(317)**

BLASTING AIDS in the form of 3 pocket-size charts are offered by the *Atlas Powder Company.* The Blasting Cost Chart provides a method of making cost records quickly while drilling, loading, and shooting a blast. An on-the-spot record of the blast loading pattern can be made on the Loading Chart. Space for a brief general record of each blast is provided on the Blast Summary Card. **(318)**

PACKAGED CENTRALIZED CONTROL SYSTEMS are described in a bulletin available from *Protection Controls, Inc.* The bulletin illustrates various custom-engineered control panels which combine a wide range of sequencing, supervising, indicating, and power controls for industrial processes, machine automation, and heating applications. **(319)**

A SELF-UNLOADING BULK MATERIAL TRANSPORT, known as the Model FBT-H Bulkmaster, is available from *Dorsey Trailers* in five sizes with capacities of 400, 480, 560, 640, and 720 cu. ft. An illustrated folder containing standard specifications is offered. **(320)**

FIRST CLASS
PERMIT NO. 44
CHICAGO, ILL.

BUSINESS REPLY CARD
No Postage Stamp Necessary if mailed in the United States

—POSTAGE WILL BE PAID BY—

Pit and Quarry Publications

431 South Dearborn Street

CHICAGO 5, ILL., U.S.A.

NEW SUBSCRIPTION ORDER FORM

Send PIT AND QUARRY to me for

____One Year $3* ____Two Years $5 ____Three Years $6

____Payment enclosed ____Bill me ____Bill company

Name_____ Title_____

Company_____

Address_____

City_____ State_____

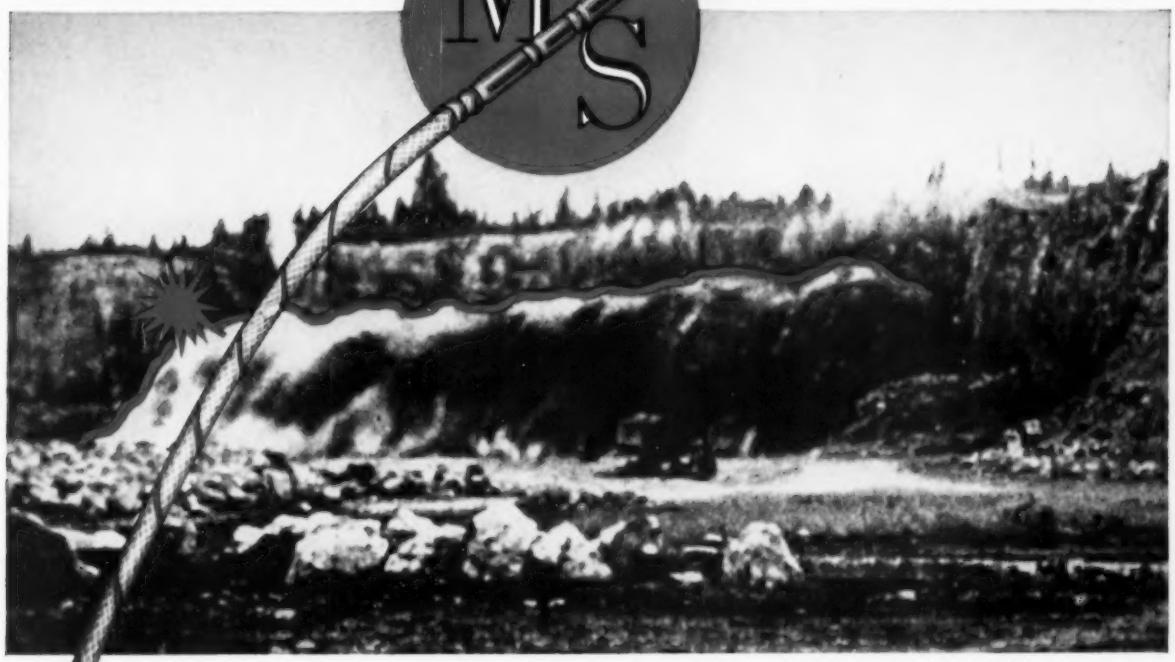
Type of business
and products_____

*U. S., U. S. Possessions, and Canada only.

Pan American countries, $10 a year; elsewhere, $15 a year.

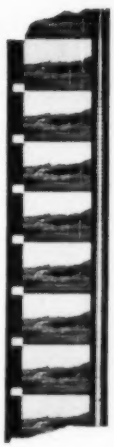
For Millisecond Delay Blasting

PRIMACORD® MS CONNECTORS*



are now available in three periods: 5, 9 and 17 MS

A Primacord MS Connector consists of a metal tube 2¾ inches long, containing an element that produces a delay measured in 5, 9 or 17 MS. A foot of Primacord is crimped in each end of the tube. The Primacord trunk line is cut between holes and the MS Connector joined to each of the two ends with a tight square knot, or lapped with pressure-sensitive tape. Packed 50 to a cardboard tube, 500 to a case.



16 mm movie film from which this enlargement was made.

This unretouched photograph was enlarged from a 16 mm frame. It shows a multiple hole blast detonated with Primacord, and hooked up with Primacord MS Connectors in the trunk line. Note the steady progress of this blast from the point of initiation at the left, as indicated by the red line.

Millisecond detonation of Primacord down lines in medium size holes offers many advantages in multiple hole blasting. Millisecond delay relieves burden, results in improved fragmentation. Less explosive may be required than for comparable instantaneous blasting. Decreased vibration and concussion, controlled throw and reduction of bootlegs are other advantages.

Under certain conditions the danger of cut-off holes can be minimized when Primacord MS Connectors are used on the order of 5, 9 or 17 milliseconds. In any event, the presence of unexploded powder in the muck is less hazardous when Primacord is the detonating agent. It cannot be set off by stray electrical currents, sparks, or ordinary shock, but must be detonated with fuse and cap or electric blasting cap.

For more information see your explosives supplier or write to

*Manufactured by E. I. duPont de Nemours & Company. Available through explosives suppliers

MS-1

THE ENSIGN-BICKFORD COMPANY

Simsbury, Connecticut • Since 1836

Safety Fuse, Primacord® and Detacord® Detonating Fuse, Ignitacord®, Quarrycord®, Pyrotechnical Devices and Blasting Accessories

DESIGNS of more efficient machines–or of a complete pack house from bins to loading dock–are continually being developed by St. Regis engineers.

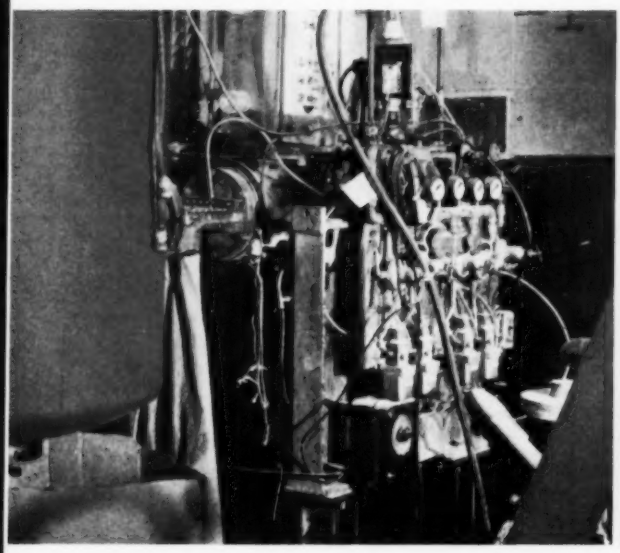
MEN AT WORK: PLANNING

L.C.P.T.–lower cost per ton (or per barrel)–means economical multiwall packaging of cement. It is brought about by a combination of research, bag design, packaging equipment and materials handling methods – all working together.

St. Regis maintains the widest range of research, engineering, development and testing facilities in the Industry. That is why St. Regis bags and equipment produce L.C.P.T. packaging today. That is the reason why St. Regis is able, also, to make continuous efforts toward producing cleaner bags, closer control of weights and even more efficient packaging methods.

At Providence, machines are designed, developed, built in prototype. They are shop tested, put on the job in the field. Then–and only after this exhaustive testing –they are manufactured for the cement industry.

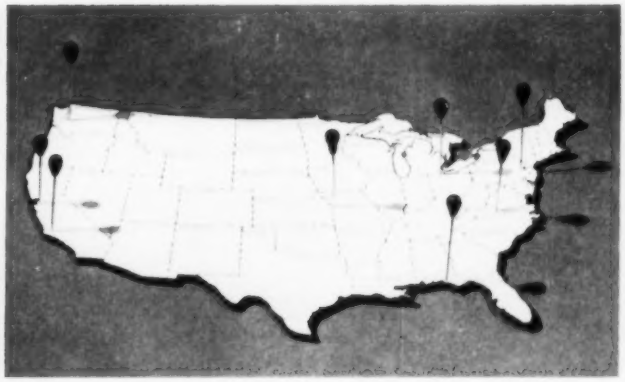
In Pensacola, specialized experience and equipment, backed by extensive research facilities, result in better bags for the cement industry. Latest and most efficient



FLOW of solids is a new area for research that has been pioneered by St. Regis to help cement packers achieve lower cost per ton (or barrel) output.

PRODUCTION facilities at Providence where better machines are built. Seen under construction are 150FC packers (foreground)—latest in the cement field.

BAG DESIGNS that *sell* are a specialty of the St. Regis Pensacola facilities. A portion of the design department is shown here.



DELIVERY to meet your needs is assured by the strategic location of the eight St. Regis multiwall bag plants. Prompt service helps you to keep inventories at economic levels.

L.C.P.T. PACKAGING FOR YOU!

cement bag is the super stepped-end multiwall bag.

In the field, St. Regis Sales Engineers bring unrivalled knowledge of both packaging and the cement business to bear on the specifics of each problem. Conveniently-located plants assure you of bag supply at all times.

Whether you need a single machine or a complete pack house, St. Regis can supply or design and produce the equipment you require.

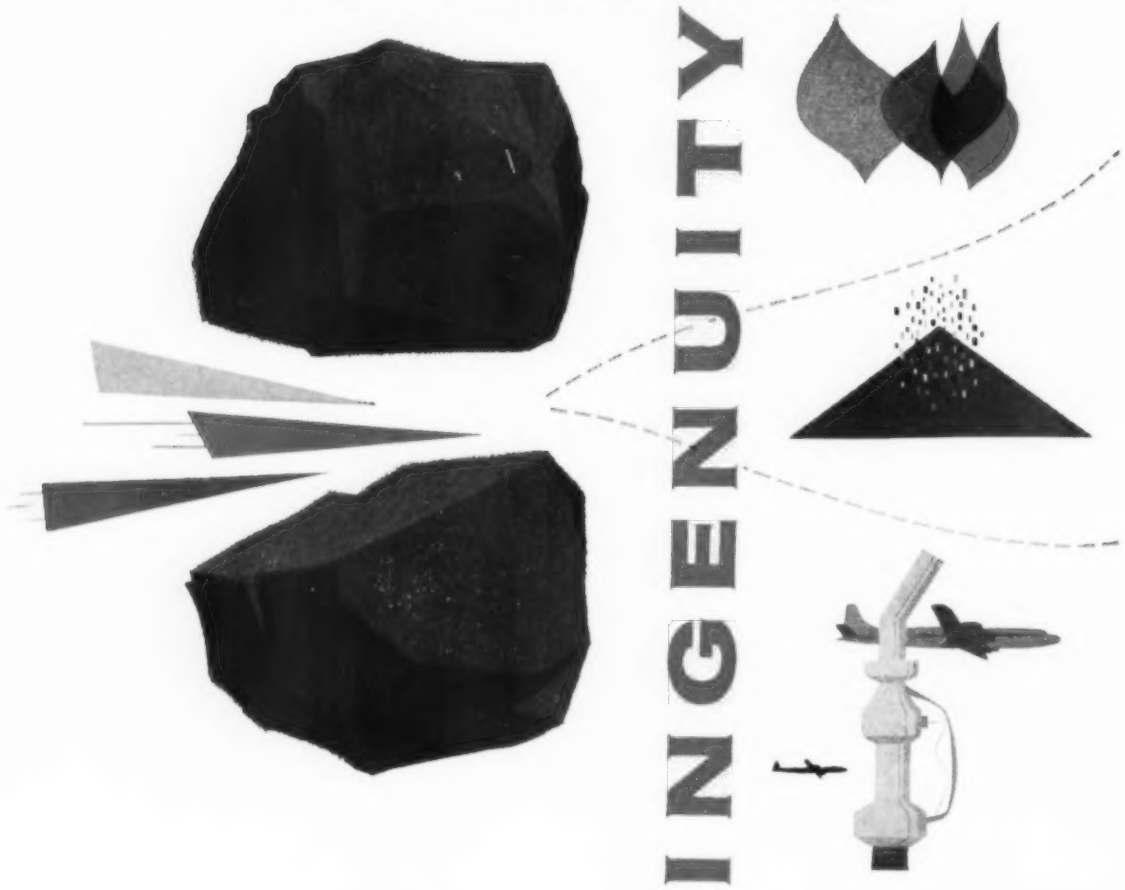
In Multiwall Packaging, St. Regis Means Lower Cost Per Ton

MULTIWALL PACKAGING DIVISION

St. Regis PAPER COMPANY

150 EAST 42ND STREET, NEW YORK 17, N.Y.

call KE for plant expansion or new facilities



has made KE a major engineer-contractor serving Minerals and Petroleum

Nation's pioneer major commercial Gilsonite refinery near Grand Junction, Colorado... Another example of KE ingenuity.

Ingenuity at work—at American Gilsonite, Kaiser Engineers designed and built an enclosed, controlled-atmosphere calciner with associated power and plant equipment making possible 100% utilization of raw Gilsonite. First major all-commercial Gilsonite refinery built, the new plant produces 99.50% pure coke, extreme purity gasoline, and uses gaseous residue to power the entire facility.

From economic analysis through start-up, KE builds ferrous, non-ferrous, industrial minerals and petroleum processing plants; brings valued experience to every phase from mining and beneficiation to transportation and materials handling.

Let KE ingenuity save time and money for you. With your first thought of new facilities or expansion, call KE.

KAISER ENGINEERS engineers—contractors
Contracting since 1914

Division of Henry J. Kaiser Company • Oakland 12, California • New York, Pittsburgh, Washington, D.C., Buenos Aires, Calcutta, Dusseldorf, Montreal, Rio de Janeiro, Sydney, Tokyo

4385

North...south...east...or west...

pit owners cut costs with rugged pivot-steer haulers

From Georgia to Wisconsin... from Virginia to California... pit owners are operating under widely varying job and weather conditions. But there's one thing all pits shown have in common... the type hauler they bank on to cut pit costs. It is the rugged LeTourneau-Westinghouse Tournapull® Rear-Dump.

Wherever they operate, these machines dump clean and fast... clear over banks, or into hopper. Front-wheel drive holds Rear-Dump steady and safe at soft bank-edge. Units have big, wide, all-steel bodies for fast loading and low maintenance. And, go-anywhere 'Pulls* haul through mud or slippery going where conventional haulers would have to call it "quits."

Read these owner-verified reports... then give us a call. We'll be happy to show you how these electric-control Tournapull Rear-Dumps can fit into *your* operations to help *you* cut pit costs. Three sizes: 11, 22, and 35 tons; with 138, 226, or 335 hp diesel engines.

N

Wisconsin gravel pit — In an effort to step-up production and cut hauler maintenance expense, this large gravel pit replaced a fleet of trucks with 3 Tournapull Rear-Dumps — 2 "D's" and a "C". Says pit superintendent, "Most truck bodies are too thin. Our work is also too hard on truck tires, transmissions, differentials, springs, and drive shafts. These rugged L-W units outlast ordinary haul trucks 10 to 1."

Virginia limestone pit — 3 D Rear-Dumps replace 10 trucks... together, haul 1000 tons of rock to crusher per 8½-hr day. Comments owner, "We went through $56,000 worth of trucks in 5 years before we switched to Tournapull Rear-Dumps. These machines are the only thing for hauling rock. Trucks just can't compare." Says operator, "They're as simple to run as a car. I like 'em fine!"

W

E

California quarry — Tough underground tunneling operations required a rugged hauler that could maneuver in extremely cramped quarters, haul over narrow, winding roads. Pit owner's choice — 3 C Tournapulls with 22-ton Rear-Dumps. Unit is shown making continuous 180° turn (with body in dump position) in area just 20'8" wide. Electric controls also contributed to ease of operation and safety.

Georgia kaolin pit — Despite wet, slippery roads, 2 D Tournapulls with 11-ton Rear-Dumps haul sand and red clay overburden 500' to dump in 1 min 24 sec. With electric-hoist, bowl can be lifted for full, instant dump, or held at any angle for slow, precision feeding into hopper. Mine superintendent likes 'em, "cause they're easy to maneuver... pull themselves easily out of soft footing."

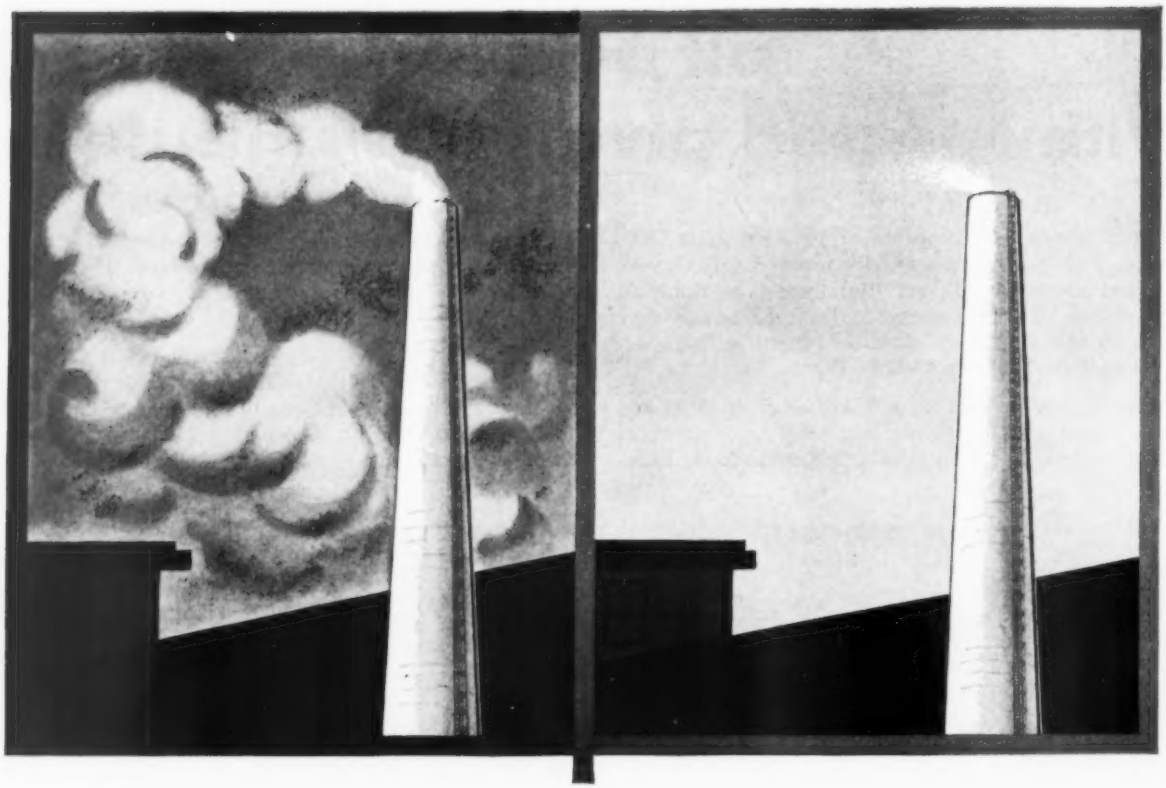
S

*Trademark R 1836 MO 1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit



win your fight against air pollution

with a Dracco Dust Control System

Dracco can be your most helpful ally in the fight against air pollution.

For over 40 years, Dracco has specialized in producing cloth filtration and cyclonic equipment for control of airborne particles. This includes a comprehensive variety of collectors and filters to solve any industrial dust or fume problem, large or small.

Today Dracco systems satisfy the toughest anti-pollution laws in many of the nation's largest metropolitan areas. In anticipation of even more stringent ordinances, Dracco research is developing advanced filtering media and radically new agglomeration and collection techniques.

You can take advantage of this know-how by consulting Dracco on your problems of producing your company's most important new product—*pure air!* The result will be a soundly engineered system that combines economy with reliable long-term service.

When you are ready to tackle that air pollution job, remember Dracco.

Multi-Bag Filter collects over ½ ton of dust daily at large eastern manufacturer, meets strict metropolitan air pollution requirements.

DRACCO DIVISION OF FULLER CO.

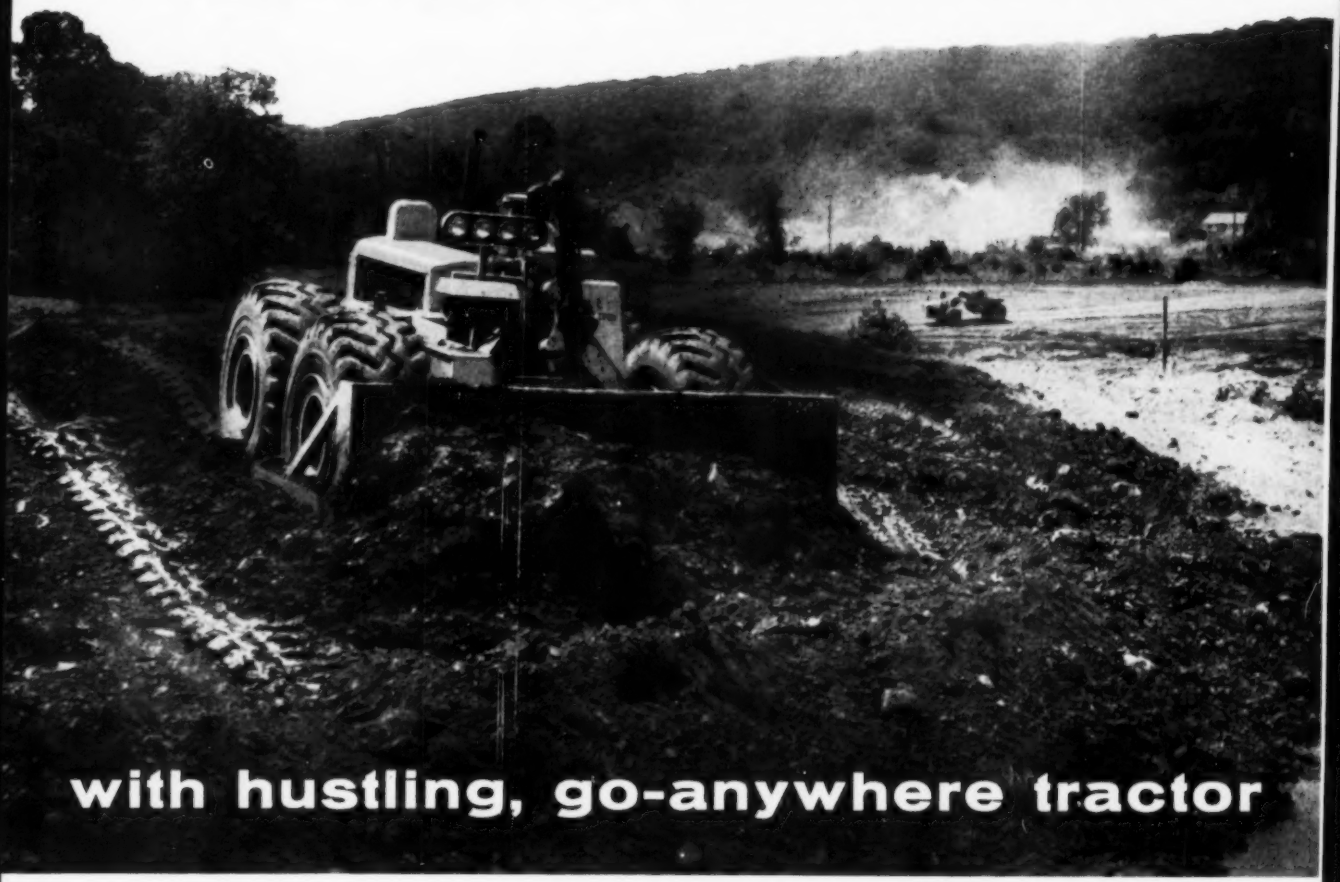
4050 East 116th Street · Cleveland 5, Ohio

DRACCO *airstream* conveyors
dust control equipment

A SUBSIDIARY OF FULLER COMPANY

(Pronounced Dray'co)

Shrink distance...and OVERHEAD



with hustling, go-anywhere tractor

Are you still supporting *part*-time pit workers — 3 or 4 crawler tractors — for maintenance jobs? You're carrying unnecessary overhead if you do. Limited speed and mobility tie crawlers down to a limited working area. Lack of continuous work in those "pockets" often keeps them idle much of the day. Yet the cost of owning and maintaining a fleet of localized dozers is continuous.

It's possible that you may be able to replace those inefficient units with a single tractor . . . a mobile dozer-*on-rubber* that goes anywhere anytime you have work to be done. The 17-mph, 218-hp LeTourneau-Westinghouse C Tournatractor® is a "hit-and-run" specialist that handles pit housekeeping *just* as efficiently as a fleet of several special-purpose crawlers and can often cut clean-up and other dozing expense by half the present cost or more.

Travels at twice crawler rate

Tournatractor gives you the speed and mobility that pays off in servicing scattered locations. Travel to the next job is at speeds up to 17 mph — twice as fast as that of most crawler-mounted dozers.

Speed ranges, 4 forward, 2 reverse, are selected by simple hand lever. Within ranges, torque converter automatically adjusts power to load. Blade movement is accurately controlled electrically, through fingertip dashboard switches.

Check your multiple tractor operations for productive hours of operation. If travel and waiting time figures 30% or more be sure to ask for a Tournatractor demonstration.

Stripping dirt and clay overburden is just one of many jobs C Tournatractor takes in stride for Millbrook Quarries, Inc., Broad Run, Va. Handy "hit-and-run" dozer also cleans up pit after blasting, shapes limestone stockpiles, cleans around crusher, and tows equipment. Output averages 1,000 tons per day.

"If I could get a hold on it, I could move a mountain with this Tournatractor," says Operator Claude Wampler at Millbrook Quarries. "This dozer's got plenty of power and speed, doesn't take all day to get to a job. It's easy to throttle down from high travel-speed."

CT-2027-MQJ-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Enter 148 on card, page 139

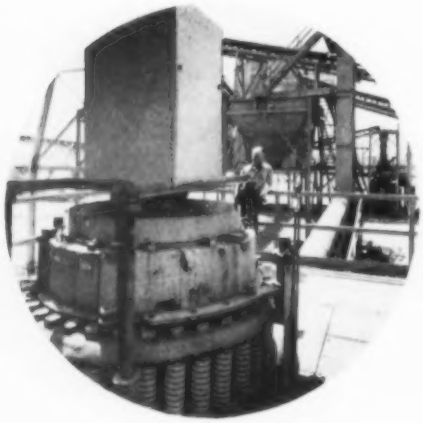
Make more profit on the jobs ahead...

with SYMONS® CONE CRUSHERS for volume production of quality aggregate

Here is a dramatic example of the vast contributions to the progress of mankind being made by the construction industry. In modern engineering and huge construction projects such as this, specification aggregate has assumed an increasingly important role. To meet the constantly growing demand for vast tonnages of quality aggregate used in concrete and bituminous highways, Symons Cone Crushers are today, more so than ever before, the first choice of leading producers throughout the world. Symons Cone Crushers are also used in sand preparation operations.

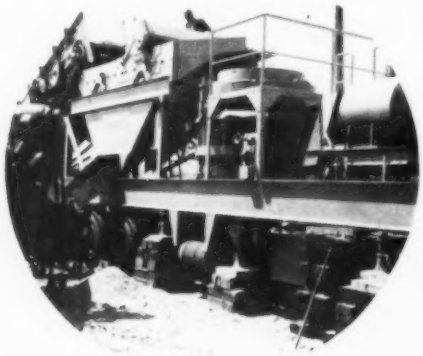
For in aggregate and sand production . . . *as in all of the great ore and industrial minerals operations the world over* . . . no record equals the performance of Symons Cone Crushers that have so consistently produced, economically and efficiently, great quantities of finely crushed product resulting in higher profit per ton per hour.

Before you submit *your* next bid, get full information about Symons Crushers.



FOR STATIONARY PLANTS

Symons Cone Crushers are the choice of leading contractors and producers for primary, secondary and finer reductions in all types of aggregate operations. Available in both Standard and Short Head types, Symons Cones are built in sizes from 22" to 7' in diameter, for capacities from 6 to 900 or more tons per hour.



FOR PORTABLE PLANTS

Symons Cone Crushers are being used in increasing numbers for portable and semi-portable crushing plants. Illustrated is a typical Cedarapids Intermediate Scalping Unit, using a 4-ft. Symons Cone Crusher. Unit is serving a large Midwest sand and gravel producer.

SYMONS . . . a registered Nordberg trademark known throughout the world.

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SYMONS PRIMARY GYRATORY CRUSHERS

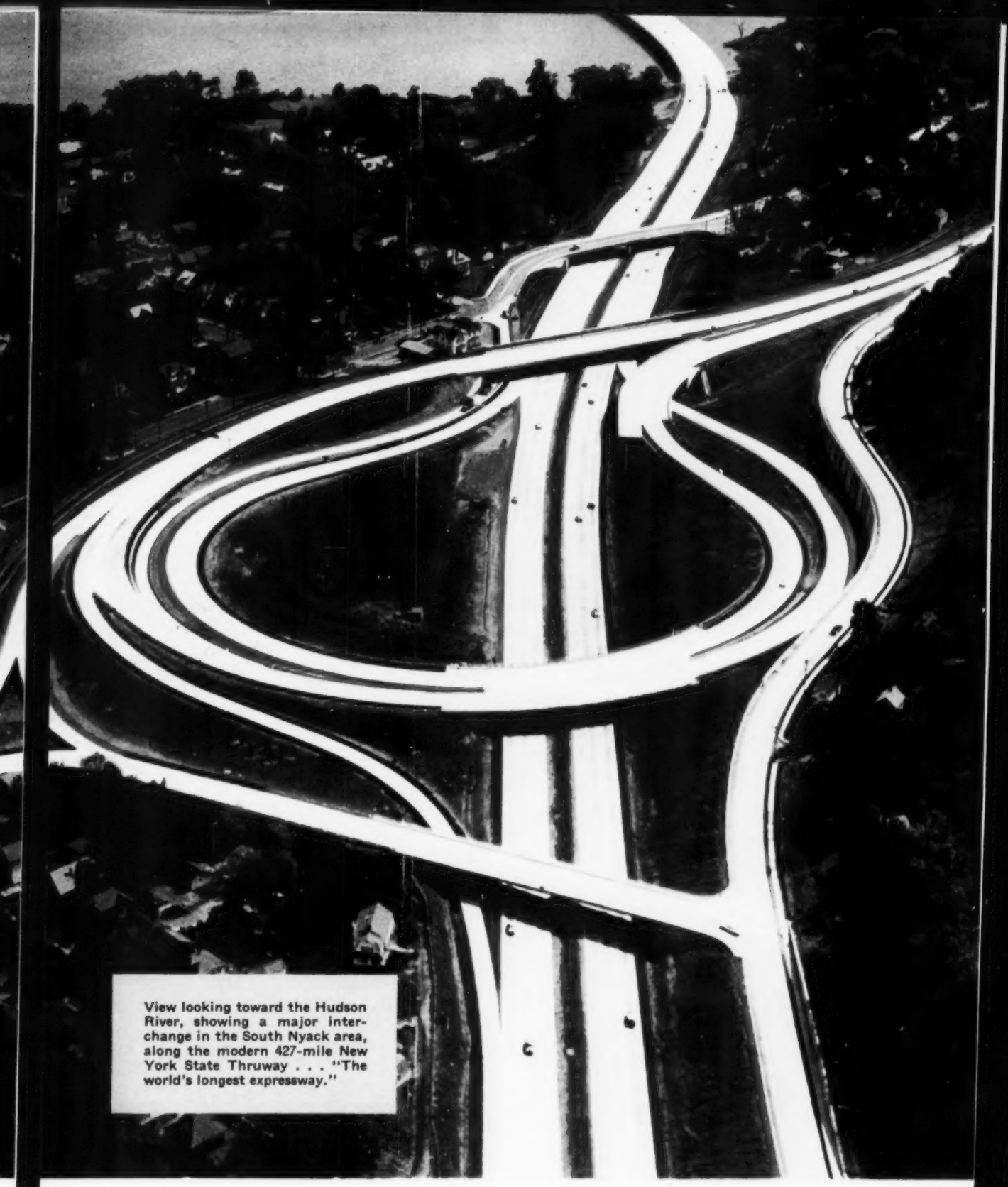
NORDBERG GRINDING MILLS

SYMONS VIBRATING GRIZZLIES

SYMONS VIBRATING SCREENS

ROTARY KILNS and COOLERS

NORDBERG ENGINES



View looking toward the Hudson River, showing a major interchange in the South Nyack area, along the modern 427-mile New York State Thruway . . . "The world's longest expressway."

C558

NORDBERG MFG. CO.
Milwaukee 1, Wisconsin

NORDBERG

ATLANTA • CLEVELAND • DALLAS • DULUTH • HOUSTON • KANSAS CITY • MINNEAPOLIS • NEW ORLEANS • NEW YORK • ST. LOUIS
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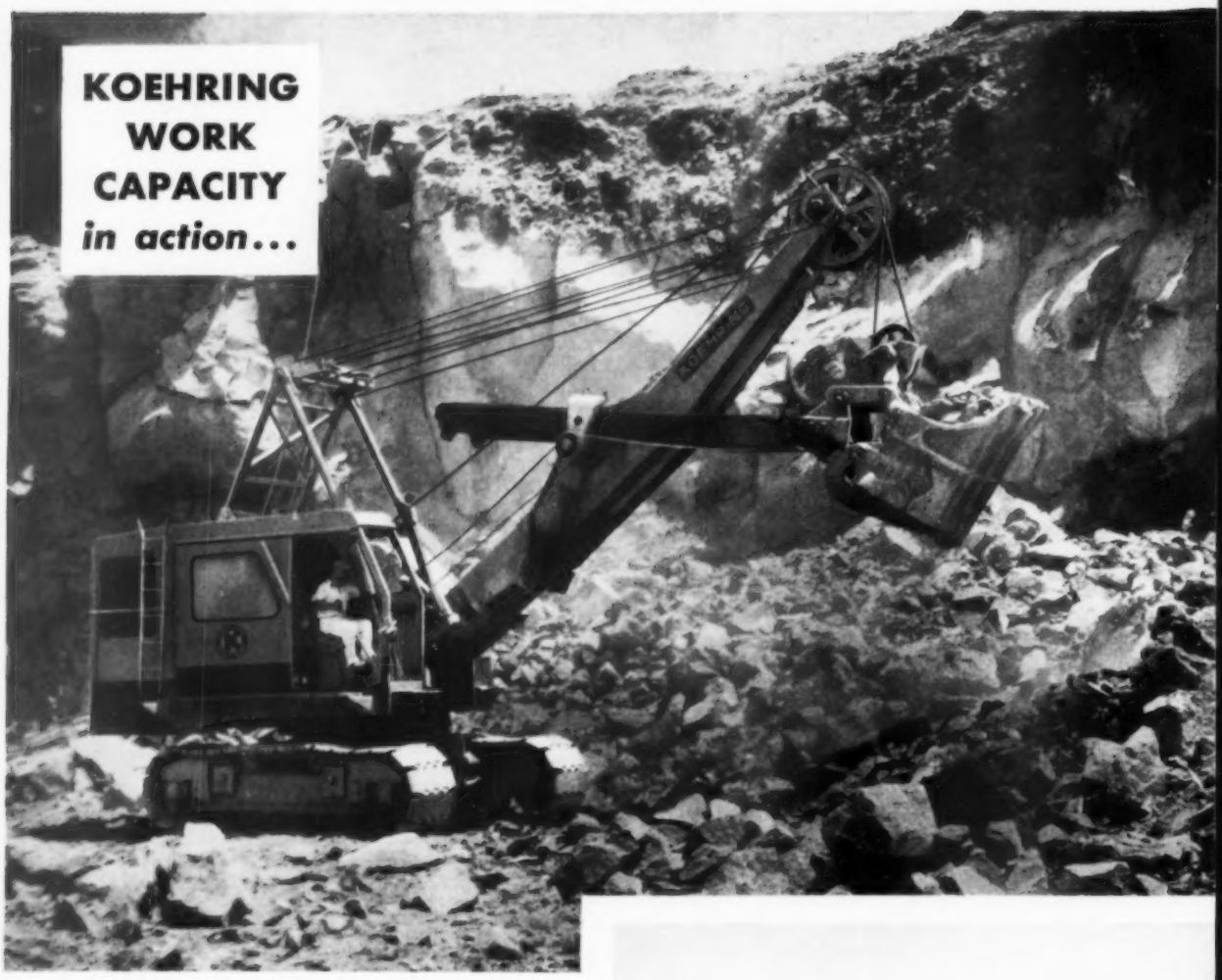


Heavy-duty rock shovel — Owner of this quarry used a Koehring® 1½-yard 605 to load out blasted rock. Powerful, 2-section chain crowd, and rugged digging strength of its deep-section boom and dual dipper sticks proved more than a match for the heavy rock. It's shown here with 22-foot boom, 16½-foot sticks — also available with 28-foot high-lift boom and 23-foot sticks. Strength and stability as a shovel increase the 605's work capacity with all attachments. For proof — check its lift rating in Koehring chart on opposite page.

Long-reach dragline — Here's a special size machine that fills a production gap on many operations — the Koehring 805. It handles 2 to 3-yard dragline bucket on 50 to 150-foot boom. Converts to clamshell, 52-ton lift crane, 2-yard shovel. Have Koehring distributor demonstrate what this big 805 will do on your stripping, stockpiling, lifting, loading.

KOEHRING HEAVY DUTY

KOEHRING DIVISION OF KOEHRING COMPANY, Milwaukee 16, Wis.

High-lift stripper — Look at the work range of this 1205 stripping shovel. When equipped with 3-yard dipper on 40-foot boom, it has a cutting height of 42 feet-10 inches, and dumps at 31 foot-5 inch height. That's with boom at 45° angle. Where extra reach is needed, you can use a 2½-yard dipper on 50-foot boom — and get 51 foot-4 inch cutting height, and 40 foot-10 inch dumping height, at a 45° boom angle. (For heaviest digging, a standard Koehring 1205 shovel has 3-yard dipper on 30-foot boom.) Depending on weight of materials, it also handles 3 to 4-yard dragline or clamshell buckets on 60 to 170-foot boom — details in chart below.

25-ton handyman — With its high speed mobility on rubber, Koehring 305 truck crane is a handy, heavy-duty material-handling rig around mines and quarries. Installs machinery, unloads heavy equipment and supplies — safely lifts up to 25 tons. Has full complement of clamshell, dragline, shovel or hoe attachments for all-round use.

Koehring excavators and cranes also manufactured in:
CANADA • ENGLAND • SPAIN • JAPAN

Quick facts on KOEHRING WORK CAPACITY:

MODEL	TYPE OF MOUNTING	CRANE LIFT CAPACITIES (Rubber-tired machines rated at 85% of tipping load.)	
ON RUBBER			
205	3-axle truck, or 21.5 mph Cruiser	30,000 lbs.	at 12-ft. radius
305	3-axle truck, or 18 mph Cruiser	50,000 lbs.	at 12-ft. radius
330	3-axle truck	60,000 lbs.	at 15-ft. radius
435	4-axle truck	70,000 lbs.	at 15-ft. radius
545	4-axle truck	90,000 lbs.	at 15-ft. radius
ON CRAWLERS	Size shovel	CRANE LIFT CAPACITIES (Crawler ratings based on 75% of tipping load.)	
205	½ Cu. Yd.	20,000 lbs.	at 10-ft. radius
305	¾ Cu. Yd.	30,000 lbs.	at 12-ft. radius
405	1 Cu. Yd.	40,000 lbs.	at 12-ft. radius
545	(Crane only — 85% rating)	90,000 lbs.	at 12-ft. radius
605	1½ Cu. Yds.	72,300 lbs.	at 12-ft. radius
805	2 Cu. Yds.	104,200 lbs.	at 12-ft. radius
1205	3 Cu. Yds.	190,000 lbs.	at 12-ft. radius

Proved again and again over the roughest, rockiest going in all the world, **GENERAL** Truck Tires are NYGEN® - built to get every job done faster and for less whether it be in logging, construction, quarrying or mining.

Specify GENERALS on your new equipment

THE GENERAL TIRE & RUBBER COMPANY, AKRON, OHIO

CASE HISTORIES

N/D double row ball bearings in trolley wheels resist extremely heavy radial and thrust loads and rigidly resist misaligning forces.

Photo: courtesy of The Louden Machinery Co.

N/D Double Row Bearings Improve Quality...Turn a 37¢ Saving Per Trolley Wheel!

CUSTOMER PROBLEM:

Improve quality and efficiency of trolley wheel assemblies which are often subject to heavy shock loads and contaminating conditions. Require sealed bearings which eliminate lubrication maintenance.

SOLUTION:

N/D Sales Engineer suggested New Departure sealed and lubricated-for-life double row ball bearings. These extremely efficient dual purpose bearings resist heavy radial and thrust loads . . . from every direction, and in any combination. In addition to this rugged feature, they shut out dirt . . . eliminate the need for relubrication because they're equipped with exclusive N/D Sentri-Seals. What's more, the single New Departure bearing replaces two separate bearings previously used on each side of the trolley wheel yoke to net a cost and assembly-time savings of 37c per unit . . . an approximate $3,300 in savings annually! The end user of these rugged, higher-quality trolley wheel assemblies receives long trouble-free, virtually maintenance-free, performance.

Chances are this bearing, or another of New Departure's wide selection of production bearings, will help lower production costs of *your* product. For more information, call the Sales Engineer in your area or write Dept. O-3.

NEW DEPARTURE

DIVISION OF GENERAL MOTORS, BRISTOL, CONN.

NOTHING ROLLS LIKE A BALL

THIS IS

6583

THE IMAGE OF CF&I ...MAKER OF STEEL

He's a giant steelman. He makes good steel and steel products for the diversified needs of today's economy. He anticipates tomorrow's requirements. He is constantly improving products through research and new manufacturing techniques.

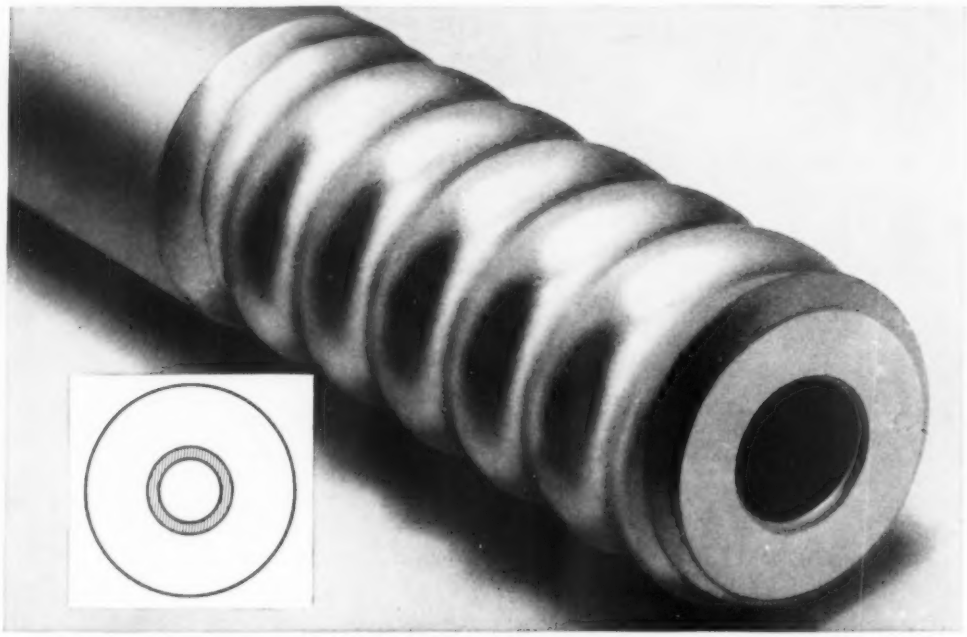
His steel mills extend across the country. In them, he guards every step of manufacturing by rigid quality controls. And in his national network of offices and warehouses, he not only *sells* steel products, but he *serves* their users in every possible way.

He is the dynamic image of CF&I . . . the symbol of dependable steel products. Look for him when you buy.

Plants at:
Pueblo, Colorado • Oakland and South San Francisco, California
Buffalo, New York • Claymont, Delaware • Palmer, Massachusetts
Birdsboro, Pennsylvania • Roebling, New Jersey • Trenton, New Jersey
40 Warehouses and 60 Sales offices located coast to coast

THE COLORADO FUEL AND IRON CORPORATION
DENVER • OAKLAND • NEW YORK

NEW ROPE THREAD MAKES UNCOUPLING EASY WITH SANDVIK COROMANT EXTENSION STEELS



Rope-Type Threads Afford No Starting Points for Fractures

Connections used in extension drill-steel must be easy to assemble and uncouple, and connections must not become weak links during the actual drilling. Sandvik Coromant's new patented rope thread makes it easy to join and uncouple the equipment . . . yet gives a solid and positive connection. The gently rounded form of this thread means trouble-free performance—eliminates common thread and coupling failures found in "saw-tooth" threads. The complete equipment—bit, rod, coupling sleeve and shank adapter—are all dependable Sandvik Coromant parts made of world-renowned Sandvik alloy steel. A further advantage to the user is that the steel can be re-threaded. Atlas Copco has special literature on Sandvik Coromant extension steel and long-hole drilling, available to you with no obligation. We suggest you write today!

Atlas Copco

610 Industrial Ave.
Paramus, New Jersey

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Distributors of COMPRESSORS, ROCK DRILLS, PNEUMATIC EQUIPMENT, SANDVIK COROMANT DRILL STEEL and CARBIDE BITS

CATERPILLAR'S PROJECT PAYDIRT

***PROJECT PAYDIRT** pays off for you again*

BIG NEW CAT No. 14 TURBOCHARGED MOTOR GRADER

PROJECT PAYDIRT: Caterpillar's multi-million-dollar research program—to meet the continuing challenge of the greatest construction era in history with the highest production earthmoving machines ever developed.

ENGINE HP (rated at sea level)—150. **BLADE,** standard—12 ft.; optional—14 ft. **TIRES,** all around—14.00-24.
WEIGHT—29,280 lb. **TRAVEL SPEEDS,** 6 forward and 2 reverse—2.6 to 21.6 MPH. **TURNING RADIUS**—36 ft.

IN THE new No. 14 Series B, Caterpillar brings you the most versatile grader in the "big machine" field. Another major achievement in "Project Paydirt," the grader answers your need for a giant unit that comes through dependably with higher, faster, lower-cost production for you on today's big jobs.

The first and only Turbocharged motor grader, the 150 HP No. 14 operates at highest practical working speeds with either a 12-ft. or 14-ft. moldboard. It incorporates the latest engineering advances developed by Caterpillar research with exclusive time-tested Caterpillar features. Some are shown here, but there are many more. They all pay off in this one fact: You can use the No. 14 profitably on—

—power applications like heavy spreading, ditching, grading and bank sloping.

—control applications like light spreading, fine grading, blading and maintenance.

As a result, this big all-purpose grader will earn its keep on every job with high capacity and low operating cost. But see for yourself. Get the complete facts about the No. 14 from your Caterpillar Dealer. Say when and where—he'll demonstrate!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

ADVANCE FEATURES OF THE NO. 14

PRECO AUTOMATIC BLADE CONTROL: Another Caterpillar exclusive, optional on the No. 14. Operator selects desired slope on dial. Now transistorized for freedom from maintenance and adjustment, the unit automatically maintains blade slope within ⅛ in. in 10 ft.

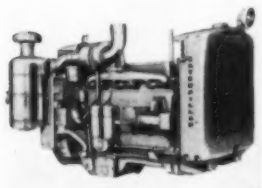
EXCLUSIVE OIL CLUTCH: Provides up to 2,000 hours' service without adjustment, equal to about 12 months' "adjustment-free" operation.

POWER STEERING AND POWER BRAKES: Provide fast, positive response and ease of operation that help operator maintain high production anywhere.

TUBELESS TIRES—14.00-24 (10-PLY RATING): All tires are mounted on wide 10-in. rims to stiffen tire side-walls and reduce tire "roll." Large tires on front end improve machine stability.

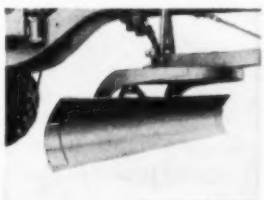
EXTRA STRENGTH FRAME: Heavy frame, drawbar and circle are ruggedly built to match engine power.

UNEQUALED VISIBILITY: An operator, while seated, has an unobstructed view of all the critical areas at the front wheels, blade toe and circle.



TURBOCHARGED CAT ENGINE: First and only Turbocharged engine in a grader. Engine provides high 18% torque rise.

NEW DRY-TYPE AIR CLEANER: Removes 99.8% of all dirt from intake air during every service hour. Can be serviced in 5 minutes.



HIGH THROAT CLEARANCE: New design permits increased clearance between moldboard and circle for greater loads.

CATERPILLAR

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DIESEL ENGINES • TRACTORS
MOTOR GRADERS
EARTHMOVING EQUIPMENT

BORN OF RESEARCH... PROVED IN THE FIELD

AMERICAN
conveyor pulleys
give you job-rated
capacity for
your toughest
conveyor applications

★ Built-in capacity to carry the belt tensions.

★ Accurately formed rims assure concentricity.

★ Correct crowning promotes true running of the belt even though the load may be unevenly fed onto it.

★ Split tapered Wedg-Tite hubs clamp the shafts with a positive grip . . . make installation easy . . . prevent "walking" on the shaft.

★ Long, high-tensile bolts hold the hubs permanently in position in pulley end discs . . . eliminate the need for retightening. Double clamping action between hubs and shaft is assured by a cross-clamp bolt in each hub.

★ No stress-raising welding in the hub area.

Write for Catalog CP-58

The American Pulley Company
Power-Transmission Division
4200 Wissahickon Avenue
Philadelphia 29, Pennsylvania

Enter 158 on card, page 139

Legal Decisions
On Industry Problems

By LEO T. PARKER
Attorney at Law
Cincinnati, Ohio

A great many cases involving the nonmetallic minerals industry were decided during the last year. Some of the more important of these are discussed in the following paragraphs.

Obvious to Skilled Mechanic

Modern higher courts consistently hold that if an invention is obvious to skilled mechanics, who study all past and old patents, a patent on the invention is void. This is so even though the Examiner at the Patent Office believed that a patent was justifiable, and a patent was issued to the inventor.

For instance, in *Richmond Screw Anchor Company v. Superior Concrete Accessories*, 256 Fed. (2d) 232, it was shown that the inventor obtained patent No. 2,335,338 for a combined spreader and tie device for forms used in erecting concrete walls. Although the Patent Office granted this patent the higher court held Claim 2 is invalid and no person or company can be liable for infringement. The court said:

"It must be understood that the prior art, even if embodied in the file wrapper and presumably considered by the examiner in the Patent Office, involved only an *ex parte* presentation, whereas at the trial the examination of the witnesses on the important prior art patents disclosed that the alleged invention of the patentee was obvious to the skilled mechanic."

Court Makes No Distinction

Last month a higher court rendered an unusual decision to the effect that there is no distinction of liability for damages to real property caused by blasts which cast stones, and debris upon the property and injuries to buildings caused by vibrations and concussions.

Generally speaking, in the past the courts have held that one doing blasting is always liable for damages caused by throwing stones and debris, but he is not liable for damages caused by vibrations and concussions, unless they were a result of his negligence.

For illustration, in *W. W. Thigpen v. Skousen & Hise*, 327 Pac. (2d) 802, the testimony disclosed that a highway contractor conducted blasting operations with dynamite in the vicinity of certain residence property. These residences were damaged by both rock, dirt, and debris cast upon the buildings and from the concussion and vibrations.

This higher court held the contractor fully liable for damages to the owners of the residences, saying:

"Strict liability should be imposed, whether the damage to a neighbor's property be caused by stones, dirt and other debris cast on his buildings and land, or results from vibrations and concussions due to the explosion. It is a distinction without a difference to classify the former injury as resulting from an invasion of one's property—a trespass—and deny character to the other, as being of the same kind. In either case, it is energy projected onto and into a neighbor's property and to call one a trespass, subject to strict liability, and the other not, is to juggle with the meaning of words."

Must Prove Damages

A quarry operator asks this question: "Certain owners of used automobile lots have sued our company claiming that dust from our plant settled on their automobiles and caused considerable damages. Can these used car lot owners recover damages from our company? If so, how much can be collected?"

These used car lot owners can recover damages which they prove in detail. They cannot recover dam-

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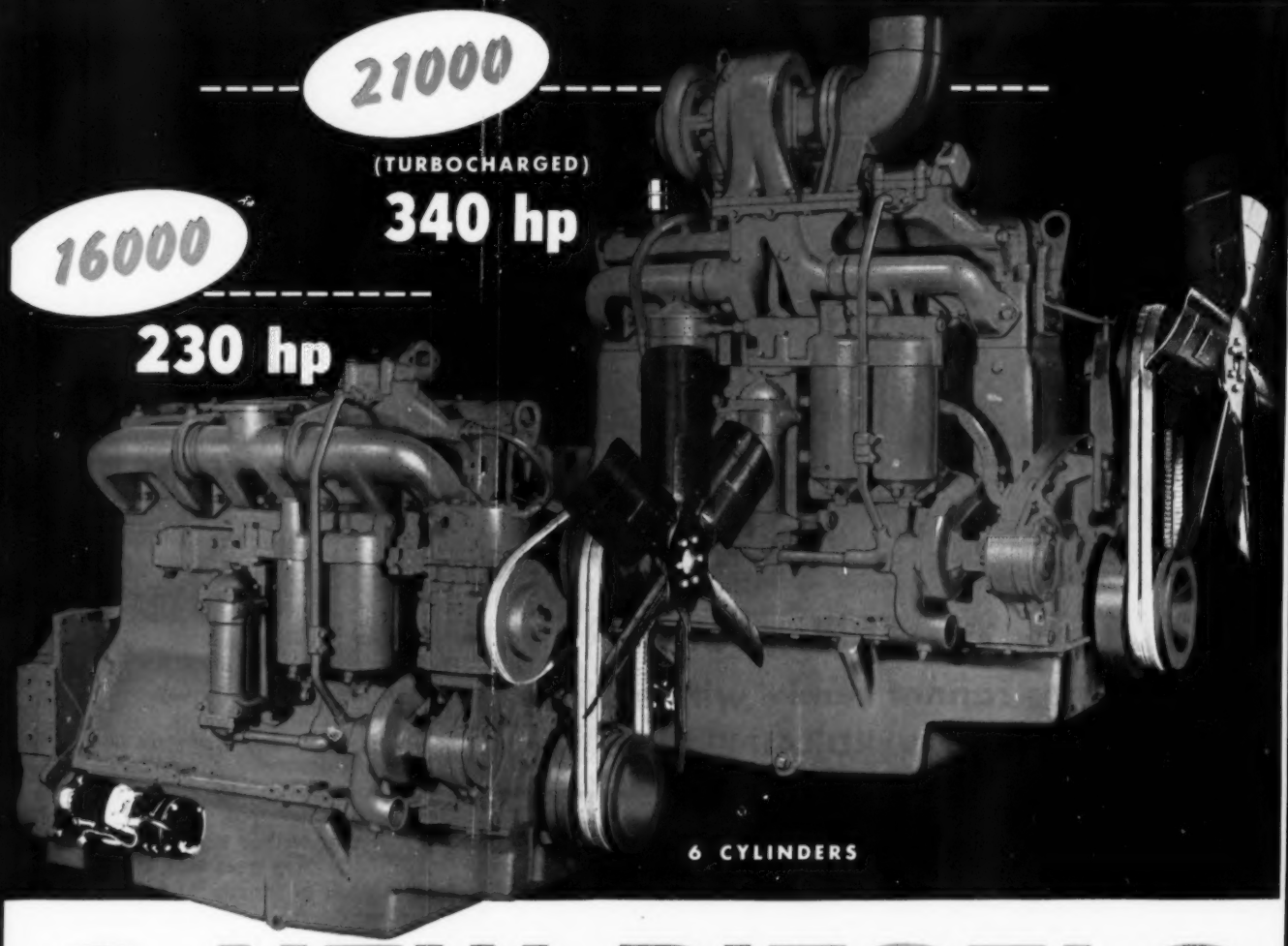


2 NEW DIESELS
THAT GIVE YOU . . .

More Horsepower

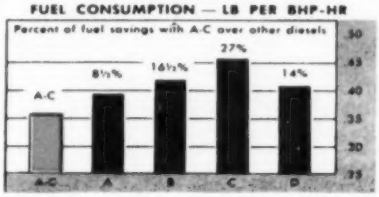
With 340 hp in the turbocharged 21000 and 230 hp in the 16000, you have the power to operate smoothly under extreme load conditions.

More Torque

. . . throughout the operating range of speeds. Torque is consistently high . . . provides the "umph" to do the job. Walks into and *through* heavy loads.

Greater Fuel Economy

This chart compares fuel economy of the new Allis-Chalmers engines to others in their horsepower class. Economy like this gives you as much as from 1 to 2½ hours of extra production a day doing the same kind of work — using even less fuel.



Clean Exhaust

These diesels have a new combustion system that provides *thorough* mixing of air and fuel for complete combustion. Fuel makes horsepower — not smoke!

Clean Design

Modern engineering means greater dependability, less maintenance, easy installation. To further simplify servicing, there is 98 percent interchangeability of parts between the Allis-Chalmers 16000 and 21000 engines.

Let your Allis-Chalmers dealer show you the many other features that put the *profit* in performance. Write for FREE new 16-page bulletin BU-540. Allis-Chalmers, Milwaukee 1, Wisconsin

ALLIS-CHALMERS

POWER FOR A GROWING WORLD

A-C ALLIS CHALMERS

BE-13

WASH WATER goes UP . . .

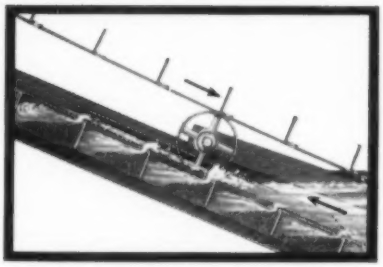
slimes cannot remix with sands . . . in the "OVERDRAIN" Classifier

The "Overdrain" Classifier is a completely new device in the field of mechanical wet classifiers. The belt, with lifting flights attached beneath, moves upwardly out of the sand bed between two stationary side shrouds—creating the effect of a series of moving, closed, washing compartments.

The only outlet from these compartments is via holes in the belt above. Surplus liquid and slimes discharge through these "overdrain" holes without mixing with the oncoming sands. The end result is an extremely clean sand discharge, excellent de-sliming—making the "Overdrain" Classifier an ideal washing device.

Acid-proof construction available.

Write for Hardinge Catalog 39-C—8



Section through "Overdrain" Classifier showing upward-moving, closed, washing compartments.

Unretouched photograph of "Overdrain" action above the belt—water and slimes discharging upwardly.

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ages merely alleged but not clearly proved.

For illustration, in *Hindman v. Texas Lime Company,* 305 S. W. (2d) 947, the testimony showed these facts: Certain automobile dealers sued the Texas Lime Company for damages caused by emission of lime dust which collected on automobiles held for resale. Testimony indicated that lime dust could not be washed from an automobile by using water alone but that it was necessary to use cleansing and polishing compound which restored the natural lustre of the paint but necessarily reduced the thickness of the protective surface and ultimately destroyed it entirely.

The dealers did not prove in detail how much expense and financial loss resulted from the lime dust. Therefore, the court refused to speculate on damages for which the Texas Lime Company is liable. The court said:

"Without a showing of some uniformity of damage that could be applied to a substantial portion of the automobiles involved, the example or sampling method here employed provides nothing more than a basis for a guess or surmise."

Also, the court refused to grant an injunction to stop operation of the lime plant. In this respect, the court said:

"The court below correctly refused to grant the injunctive relief prayed for. Such refusal is fully supported by the authorities cited by *Storey v. Central Hide & Rendering Company,* 226 S. W. (2d) 615."

Tax Lien Comes First

According to a leading higher court decision, one who holds a recorded mechanic's lien must go into a court and obtain a judgment in his favor, otherwise a tax lien filed later is superior.

For example, in *Aquilino v. United States,* 146 N. E. (2d) 775, the testimony showed that a recorded mechanic's lien has never been reduced to judgment.

After the lien was properly recorded, the United States government filed a notice of lien for unpaid taxes on the same property.

In subsequent litigation, the higher court held that the government's tax lien was superior to the mechanic's lien, saying:

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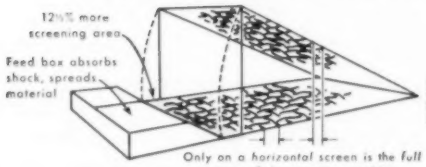
STILL FIRST CHOICE AFTER 23 YEARS

Here's why users prefer

CEDARAPIDS *HORIZONTAL* SCREENS


12½% more screening area
Feed box absorbs shock, spreads material
Only on a horizontal screen is the full area of the openings usable

Since any given length of screen provides maximum screening area when in a horizontal position, Cedarapids Horizontal Screens give as much as 12½% more screening area than an inclined screen of the same length. In addition, horizontal screen cloth openings are more nearly at a right angle to the fall of material and the full area of each opening is available for sizing. More material of the proper size goes through each opening, which means that size for size, Cedarapids Horizontal Screens give both higher capacity and more efficient gradation than is possible with an inclined screen.

Since way back in 1935, Cedarapids Horizontal Vibrating Screens have been the standard of profitable production. Because of their *horizontal* design, Cedarapids Screens give up to 30% greater screening capacity, assure more accurate gradation, and increase over-all plant capacity by their more efficient, snappy, live vibratory action. Because of their expertly engineered design and top quality construction . . . typified by fully stress-relieved boxes and screen frames . . . Cedarapids Screens have a long, trouble-free service life.

Today, Cedarapids Horizontal Vibrating Screens are the ONLY screens on the market with the high production performance and the low maintenance durability that result from Cedarapids' quarter of a century of practical, proved-on-the-job experience.

SEND FOR THIS NEW BULLETIN TODAY.
It describes the complete range of Cedarapids Screen models and sizes and explains the many exclusive features that help you increase your plant production . . . and profits.

IOWA
MANUFACTURING COMPANY
Cedar Rapids, Iowa, U.S.A.

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Cedar Rapids, Iowa, U.S.A.

Gentlemen: Please send Bulletin CS-6

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Company _____

Address _____

City _____ **Zone** _____ **State** _____

Dust Collection Performance is what you buy from Norblo

We haven't introduced a "new model" for many years!

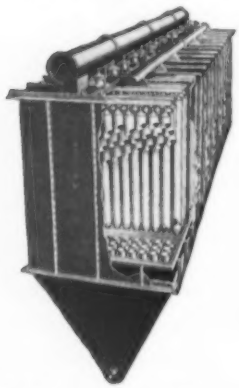
Yet Norblo Dust and Fume Collectors are completely modern—up to date. We keep them that way. And we've found it isn't the *model* that interests users . . . it's the *performance* of the equipment we recommend.

Outwardly, Norblo Equipment of several types *appears* to be just about the same as it was a quarter century ago. (There isn't a need to "stylize" these facilities.) But Norblo engineering — mechanical elements — materials and special components — all undergo constant scrutiny and testing. When improvement possibilities are discovered they are adopted at once — no waiting for next year's model!

Norblo engineers study to improve efficiency, add to equipment life, and reduce maintenance trouble and expense. Our repair parts business is terrible! (Low, that is!)

For 45 years Norblo Equipment has supplied outstanding dust arresting and recovery service for the cement and rock products industry. Norblo's "Cement Cooling in Production" process (Patented) achieves remarkable results in hundreds of American and foreign mills.

We are proud of our association with, and our opportunity to serve this important and far-reaching industry.



The Northern Blower Co.
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Telephone OLympic 1-1300

Known wherever cement is made, Norblo Automatic Bag Type Dust Collection plus Norblo Cement Air Cooling System (Pat. No. 2,350,737) combines two separate functions necessary for modern cement manufacture in one installation of maximum efficiency. Write for Bulletin 165.

Norblo ENGINEERED DUST COLLECTION SYSTEMS FOR ALL INDUSTRIES

Enter 162 on card, page 139

"It is, by now, exceedingly well settled that no state-created rule may defeat the paramount right of the United States to levy and collect taxes uniformly throughout the land."

For comparison, see *Kings County*, 224 F. (2d) 232, which involved the question of priority between the government's tax lien and a mechanic's lien in New York. In this case a contractor was entitled to be paid by the owner of the real property which had been improved. The contractor owed money both to the United States for unpaid taxes and to his subcontractor for work performed. The subcontractor filed notice of its mechanic's lien against the property about a week after the government had filed notice of its tax lien at the place where the taxpayer-contractor maintained its place of business.

The higher court held that the debt owing to the taxpayer was subject to federal levy and was subordinate to the federal tax lien for either of two reasons; on the one hand, because the government filed notice of its lien first and, on the other, because mechanic's lienors, are not entitled to challenge a federal tax lien.

Kinds of Taxes

Recently an official of a large sand and gravel company wrote asking explanations of all the various kinds of taxes payable to a state, including definition of excise taxes.

A review of late and leading higher court decisions shows that an excise tax is a tax laid on the manufacture, sale or consumption of commodities, or on licenses of persons and corporations to pursue certain occupations, or on corporate privileges. Generally, such taxes are valid.

Personal property taxes affect chattels exclusively. Hence any personal property tax law is void which attempts to tax real property. The states in the exercise of their taxing power are of course subject to the provisions of the due process and the equal protection clauses of the Fourteenth Amendment of the United States Constitution, but this Constitutional Amendment imposes no iron rule of equality, nor does it prohibit the flexibility that is appropriate to modern schemes of taxation. Hence, a state may tax real

Enter 163 on card, page 139 →

DON'T LET THIS KIND OF PUNISHMENT AFFECT YOUR PROFITS!

Texaco Simplified Lubrication Plan uses just 6 lubes to protect all your major equipment against dust, shock and vibration

When profits are measured in pennies per yard, maintenance costs can be a big factor on the balance sheet, particularly when equipment has to operate under severe conditions. Take the beating it gets from shock, for instance. Five tons of rock dropped into a truck puts a sudden, severe strain on axles, bearings and springs. Unless you have the right lubricants, in the right amounts, in the right places, your truck is going to need overhauling at uneconomically short intervals.

Texaco Lube Plan can stretch maintenance intervals. With the Texaco Simplified Lubrication Plan, you can set up maximum lubrication intervals based on the experience that Texaco has had with hundreds of similar applications. The Texaco Lubrication Engineer will work with your mechanics, helping to specify the right lubricants for each piece of equipment. And because the Texaco Plan is based on a proven combination of just six multi-purpose and specialty lubricants, it can mean significant savings in inventory, less storage problems, and can drastically reduce the danger of misapplication.

Get the full details

Your local Texaco Lubrication Engineer can give you complete information on the Simplified Lubrication Plan. Just call the nearest of the more than 2,000 Texaco Distributing Plants, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

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(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

PROVED AND PREFERRED...

Timken-Detroit® Axles are the Accepted Standard!

Timken-Detroit Heavy-Duty Tandems Are First Choice With Big Off-Highway Operators!

These superior features make the difference:

"Cradle Ride" Suspension. Free ends of long, resilient springs float in axle spring guide brackets. This permits axles to articulate freely, compensating for road irregularities. Floating springs cradle the vehicle, materially reducing road shock and eliminating source of vehicle flutter. *The load is more stable . . . driving is easier, more restful, safer.*

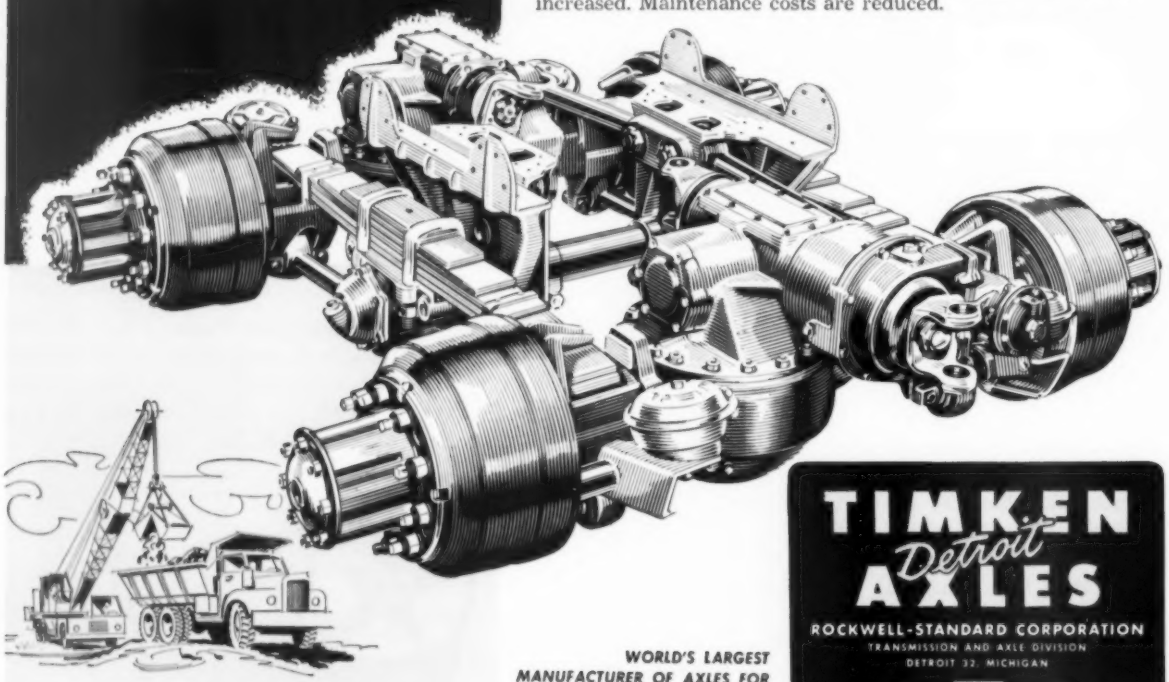
Hypoid Gears. Larger pinions and greater tooth contact give 30% more torque capacity, top efficiency and long life . . . *plus lower maintenance costs.*

Driver Controlled Inter-Axle Differential. Torque is divided equally between axles, yet wheels of one axle can turn faster or slower than wheels of other axle. This means both axles are always doing equal amounts of work. *Driving parts and tires last longer.*

Hot Forged Rectangular-Shaped Axle Housings. Rectangular shape, combined with full strength corner sections, provides the greatest strength with minimum weight and size. Welded-on bowl cover prevents leakage.

Torsion Flow Axle Shafts. More splines, plus greater root and body diameter, add extra strength.

Straight-Line Through Drive. Straight through drive eliminates all prop shaft angularity. Bearing and gear life is materially increased. Maintenance costs are reduced.



WORLD'S LARGEST MANUFACTURER OF AXLES FOR TRUCKS, BUSES AND TRAILERS

TIMKEN Detroit AXLES
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Products of **ROCKWELL-STANDARD** Corporation

and personal property in a different manner, and it may grant certain valid exemptions. Moreover, a state is not limited to mere *ad valorem* taxation. It may impose different specific taxes upon different trades and professions and may vary the rates of taxation upon various products. In levying such taxes, the state is not required to resort to close distinctions or to maintain a precise, scientific uniformity. To hold otherwise would subject the essential taxing power of the state to an intolerable supervision, hostile to the basic principles of our government and wholly beyond the protection provided by the general clause of the Fourteenth Amendment to the United States Constitution.

Seismographic Operations

A few weeks ago a higher court held that a company is not liable for damages to private property caused by seismographic operations unless negligence is proved.

For example, in *Klostermann v. Houston Geophysical Company,* 315 S. W. (2d) 664, the testimony showed facts, as follows: A man, named Klostermann, sued Houston Geophysical Company for damages he claims that the company did to his home when it performed seismographic operations in connection with its mineral explorations.

According to the testimony, the company discharged a series of high explosive charges on lands owned by Klostermann's neighbors just across a highway. One very heavy charge of explosives at a point about one thousand feet from the Klostermann residence, caused tremors and vibrations which damaged the hollow tile masonry home.

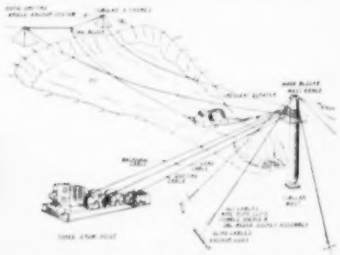
The higher court refused to hold the company liable because Klostermann failed to prove that the company was negligent in performing the seismographic operations. The court said:

"In our opinion, the Texas law in such cases is already well along the path which requires proof of fault. Many text writers hold that the theory of liability without fault, even in blasting cases, is a reversion to an outmoded law and that its adoption in explosion cases would be a step backward to primitive conceptions of an earlier century."

Profitable Sand and Gravel Handling Starts with a Sauerman DragScraper
digging *and hauling to plant*

3-yd. DragScraper digs and hauls sand and gravel from dry pit to plant hopper at 300 fpm.

This 2-yd. DragScraper is dumping river gravel dug from 50 ft. of water into grizzly feeding conveyor to plant. *See Sauerman News No. 147.*



● **THE SAUERMAN METHOD**— *showing a basic DragScraper installation. Variations of this method are Sauerman engineered to handle the toughest digging jobs at the lowest cost per cu. yd.*

A Sauerman DragScraper handles the two basic steps of material flow—digging and hauling—in one continuous operation. No double handling is required. You cut labor costs in half—or even more—because a single machine, controlled by one man, replaces the multiple equipment required by other methods.

Profitable handling is further assured by a maintenance cost of only 1½ cents per cu. yd. for the average size Sauerman installation. On larger machines, the increased volume drops this cost still lower. You'll save money on power, too, by eliminating heavy machinery with limited handling-to-dead weight capacity. You pay only the cost of moving the actual digging tool—a Crescent DragScraper.

The best Sauerman Machine for your plant is governed by the nature of the deposit, location of material, depth and plant layout. DragScraper machines in sizes from ⅓ to 15 yds. provide direct delivery to feeder, scalper or crushers at the lowest cost per cu. yd.

Why not consult Sauerman engineers about your plant? Their recommendations will be based on almost fifty years of sand and gravel excavating machinery experience. Ask for Catalog A (DragScrapers).

SAUERMAN BROS., INC. 634 SO. 28th AVE. BELLWOOD, ILL. Cable: CABEX—Bellwood, Ill

Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks

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THEY'RE HERE!

all-new BANTAM 350's

UP go capacity and earnings to all-time highs in the 3/8-yd. field!

NEW BANTAM CRAWLER has stronger, more rigid car body with two side frame sizes, standard and long, for extra stability on crane work to eight tons . . . wide base extensions and high-clearance side rails. BANTAM C-350 also features full-reversing, 2-speed travel transmission and new in-cab digging lock. New, long-boom back hoe has deep 18'10" digging depth. 7- and 8-ton capacity.

NEW BANTAM SELF-PROPELLED brings new versatility and income potential to this class. Optional 4 x 4 drive . . . new automotive-type power steering . . . independent travel, swing and hoist plus faster travel speeds . . . new bypassing box-beam outriggers for all-around stability. It's the most maneuverable, most capable rig of its kind and it has full 11-ton capacity!

These new BANTAMS are the most productive and *most proved* crane-excavators in their size ever offered. So much so, they perform and earn far above their class!

The new 350 series advances the already amazing BANTAM work scope by literally hundreds of additional jobs! You'll handle more jobs, bigger jobs, tougher jobs, trickier jobs — all faster, easier, more profitably. New, increased power (gas or diesel) . . . new, increased line pulls . . . new, speeded work cycle with instant-acting, trouble-free mechanical controls . . . new, longer crane booms (to 70') and deeper digging back hoe (to 18'10") — all these and more assure the greatest operating ease and production ever achieved in a machine anywhere near its popular size.

4 BANTAM-built new carriers

No compromise in what you want in carrier capacity or price with a BANTAM! BANTAM builds its own carriers matched to the Model T-350 basic unit for all your work requirements. You have a 4-carrier choice — exactly what you want for more of what you need in performance, stability, and road and field ability.

Most features and options

It's yours — by far the greatest flexibility ever offered in a crane-excavator. More than 25 different options virtually make you "designer" of your BANTAM strictly to your own work needs. Three types of boom hoists (one standard, two optionals) . . . power load lowering for all models . . . gasoline, diesel, LP-gas or electric drives . . . torque converter . . . 2-speed transmission . . . wide counterweight choice up to 5000 lbs. . . . house-type or all-vision cab . . . plus lots more — all in addition to 11 different quick-change attachments, *all BANTAM-built!*

Put a new BANTAM through its paces now at your BANTAM distributor's. See him now or write factory.

211

SCHIELD Bantam Co.

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World's largest producer of truck crane-excavators

This higher court went on to explain that most explosion operations are hazardous in greater or less degree. This court also said that to call seismographic operations "hazardous," everywhere and always, does not make them so and does not prove the need for liability without fault upon the operator.

Must Prove Negligence

Last month a higher court clearly held that mere happening of an accident does not render the wrongdoer liable in damages to an injured person.

For example, in *Henderson v. William Moors Concrete Products*, 91 N. W. (2d) 910, a person named Henderson was seriously injured when a stack of concrete blocks fell on him. He proved that the blocks had been stacked by the truck driver of the William Moors Concrete Products. However, Henderson did not prove that the truck driver had negligently or improperly stacked the blocks. Therefore the higher court reversed the lower court which awarded Henderson damages against the William Moors Concrete Products.

Can Extend Lease

The owner and operator of a sand and gravel firm writes: "If a person leases land and has a lease which names him as the exclusive lessee, can his heirs extend the lease?"

A leading higher court has held that the heirs of an exclusive lessee have implied rights to extend the lease.

For example, in *Hardsocg v. Grooms*, 216 N. W. 78, the testimony showed that the owner of property leased it for 5 years to one Grooms with the rights to remove sand and gravel. Soon afterward Grooms died. The heirs of Grooms sought to carry on the anticipated work under the lease, but the owner of the property contended that he intended to give the lease exclusively to Grooms. During the trial, contents of the lease contract were introduced to the court which provided: "Should Grooms make substantial investment in equipment and machinery installed on the property, he shall have the right to extend the lease for 15 years upon the same terms."

In view of the fact that Grooms had purchased expensive equipment to extract gravel from the leased property, the court held his heirs entitled to extend the lease, and said:

"Where a contract is of such nature that for its proper performance confidence and trust are reposed in the performer personally, or where the attainment of its object requires his personal services or skill, it is not assignable and does not survive; but where results are contracted for and their attainment does not depend upon personality of the doer, where it does not appear that personality is an essential consideration and the object may be attained by one person as well as another, the contract is assignable and survives. In the contract before us the lessor made no provision forbidding the assignment. Here the parties and the obligations were "to vigorously utilize said land by the extraction of the available sand and gravel resources and diligently farming the remainder."

Hazardous Work

According to a late higher court decision if an employee performs any hazardous work he or she can recover compensation under the State Workmen's Compensation Act for an injury, although his or her general work is non-hazardous.

In *Halliburton Oil Well Cementing Company v. Duncan*, 330 Pac. (2d) 222, the testimony showed that the Halliburton Oil Well Cementing Company owns a building in which are machines used in making blue prints and testing materials. A woman, named Duncan, was employed as a janitress or cleanup woman. Also, in addition to her regular janitorial duties she was required to work about electrically power-driven machines, and it was a part of her duties to cut the power off from them at various and sundry times. One day while she was waxing the floor of the building she sustained an accidental injury by slipping on the slick floor.

She was awarded compensation under the State Workmen's Compensation Act as being employed in hazardous work. This court said:

"Claimant (Duncan) is entitled to an award for the reason that she

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Write today . . . giving all information you can provide. Out of the many combinations possible with four matrices, several stone size ranges, three grades of diamonds, and various face contours we will recommend the bit we believe to be the best suited for your drilling conditions.

Always specify Sprague & Henwood "Oriented" Diamond Bits. They are described and illustrated in Bulletin 320-1.

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was performing manual labor incident to and connected with her employment."

New Law on Sale of Materials

A few weeks ago a higher court rendered an unusually important decision which may result in many retail and wholesale dealers in nonmetallic materials having to face law suits for selling a new kind of merchandise. In this same decision the higher court relieved the dealer from any and all liability although this company manufactured and sold a chemical solvent for processing materials which caused the injuries complained of.

This is important information to retail and wholesale dealers who do not realize that a manufacturer of injurious products may be relieved from liability for damages to the user, but nevertheless the wholesaler and retailer may remain liable. This is so because the higher courts are in accord with the law that retail dealers are liable for damages and financial losses caused customers who purchase injurious or damaging merchandise. In other words, the courts hold that retail dealers imply that the products they sell are reasonably worth the purchase price and, also, are suitable for the intended purposes.

For example, in *Hilo Dairy Company v. E. I. du Pont de Nemours & Company*, 245 Fed. Rep. (2d) 768, the testimony showed that the E. I. du Pont de Nemours & Company developed and marketed a chemical solvent for processing certain materials.

A user sued the E. I. du Pont de Nemours & Company for heavy damages because of injuries caused by materials manufactured by means of the chemical solvent developed by Du Pont corporation.

During the trial, testimony was given that the manager of the Du Pont Company's chlorine products division had written a letter to the company which manufactured the materials saying that he strongly recommended that the materials not be sold for the intended purposes. This letter was written after the manufacturer had expended considerable money in establishing a plant to manufacture materials in which the new chemical solvent was used.

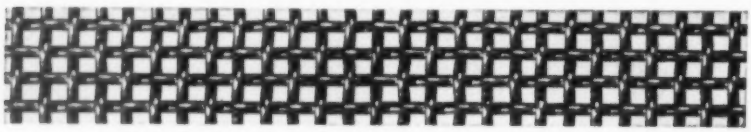
In view of this testimony, the higher court refused to hold liable the E. I. du Pont de Nemours & Company for injuries caused by use of the materials which the manufacturer continued to make and sell.

Nevertheless, this higher court indicated that both the manufacturer and the retail dealers who sold the materials may be liable in damages to users of the materials. This court said:

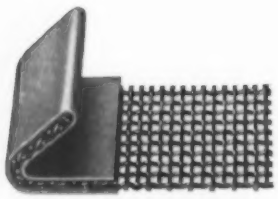
"The warning letter was clear and du Pont was not liable for the failure of Magnolia Company to heed the warning. Du Pont had a right to believe that the warning letter would not be disregarded."

As to whether the E. I. du Pont de Nemours & Company may be liable to the Magnolia Company for allowing the latter to expend $500,000 for a plant for the purpose of manufacturing the material which used the solvent is another point of law not answered at this time.

Ideal Cement Company stockholders recently approved management proposals to split the stock of the firm 3 for 1.



TYLER SCREENS LAST LONGER

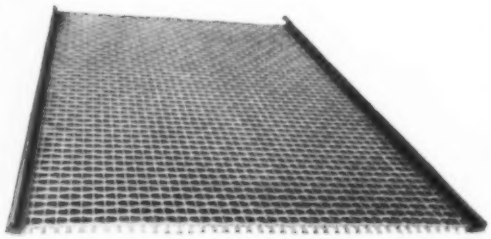


Tyler Type "AX" Hook Strip. For wire diameters from .047" to 5/16" inclusive.

Tyler Woven Wire Screens are woven with laboratory approved wires on precision machines. The high quality of Tyler Screens is apparent in their long life and service under the most difficult of screening conditions.

Tyler Screen Sections are furnished for all makes of vibrating screens in all meshes and metals. Each section is fabricated with the right type of edge or hook strip for the specification of screen cloth and to fit the particular make and model of screening machine on which it will be used.

Tyler Type "CX" Hook Strip. For wire diameters .041" and smaller.



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THE W. S. TYLER COMPANY
CLEVELAND 14, OHIO
Manufacturers of Woven Wire Screens and Screening Machinery

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Easy to Carry ... Easy to Pour

FIELD REPORT

TO: B.D.

RE: [redacted] Handle Order

Showed Mr. [redacted] our new Side Handle Bag...some of his customers had already mentioned it to him. He saw great benefits for both his dealers and their customers. He immediately recognized that it would be helpful in opening new distribution and getting more merchandising cooperation from dealers. Showed him our strength tests and the heavy abuse our handle could take. Got the order. Left him our Sales Promotion and Dealer Aid kit which he said would be useful to his Sales and Advertising Department. He plans a big promotion built around this sales "extra".

Hudson Bags increase your sales – cut your costs!

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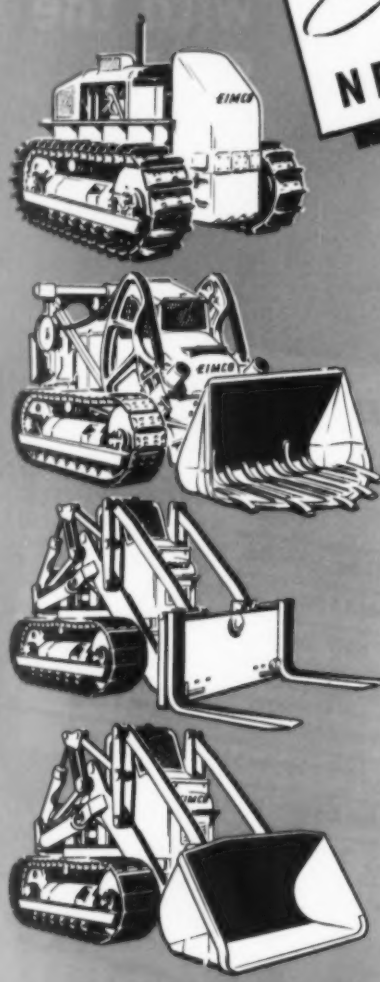
477 Madison Avenue • New York 22, N. Y.

Plants at Pine Bluff, Ark. • Palatka, Fla. • Wellsburg, W. Va.

THE BIG E Announces NEW MODEL DESIGNATION FOR SPECIALIZED CRAWLER EQUIPMENT



EIMCO 105

This is the basic **Tractor** available with **Dozer, Excavator** or **Excavator-Dozer** Attachments.

EIMCO 115

New number designation for Eimco's rugged **Steel Mill Excavator.** Extra-Strong, for use in slag pits and other steel mill areas.

EIMCO 125

This is model number for the **Front End Loader and Fork Lift . . .** fast, maneuverable, strong.

EIMCO 135

Specify this number for **Eimco's Steel Mill Front End Loader . . .** specially engineered and proven in use in steel mills throughout the world!

Every Eimco Crawler Unit gives you greater maneuverability, greater production and work-output, greater economy . . . engineered for service to your industry to save you time and maintenance costs.

Write for facts and qualified engineering assistance on Eimco . . . the MODERN Equipment.

THE EIMCO CORPORATION • SALT LAKE CITY, UTAH

EXPORT OFFICE, 51-52 SOUTH STREET, NEW YORK, N. Y.

B-388

BRANCHES AND DEALERS IN PRINCIPAL CITIES THROUGHOUT THE WORLD

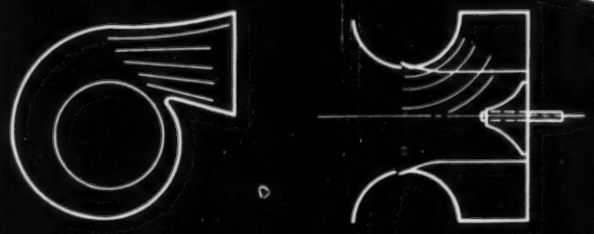
"Buffalo" Type "CR" Radial Blade Fan

Widely-used in rugged steel mill applications, the "Buffalo" Type "CR" Radial Blade Fan is unsurpassed for dependable and long-lasting service under the most severe industrial conditions.

The "CR" is unique in the fact that the same design principles which reduce wear actually increase the efficiency of these husky fans. An engineering refinement of the radial blade principle — plus a new high in streamlining the entire fan, from inlet through wheel to outlet — boosts performance at the same time that it cuts down wear. (See drawings at left.)

Add to these wear-resistant **design principles** the long-standing "Buffalo" tradition of heavy-duty reliable **construction features**, and you have an unbeatable combination of factors contributing to maximum efficiency and minimum wear.

DESIGNED FOR PERFORMANCE UNDER DEMANDING CONDITIONS



Streamlined housing and gradually diverging outlet not only increase static efficiency, but reduce housing wear because of minimum turbulence.

Mating sections of the inlet and wheel flange form a true-half-circle. Resultant smooth air flow further reduces wear and provides peak performance.

Investigate this high performance fan, designed for severe industrial service. Ask your nearby "Buffalo" Engineering Representative for full details on the "CR", or write for Bulletin FD-205.

Every "Buffalo" Fan features the famous "Q" Factor — the built-in QUALITY that provides trouble-free satisfaction and long life.

"Buffalo"

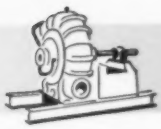
BUFFALO FORGE COMPANY

BUFFALO, N. Y.

Buffalo Pumps Division, Buffalo, N.Y. • Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

VENTILATING • AIR CLEANING • AIR TEMPERING • INDUCED DRAFT • EXHAUSTING • FORCED DRAFT • COOLING • HEATING • PRESSURE BLOWING

Another Customer Speaks



His Experience With THOMAS PUMPS Covers Period of the Last

5 YEARS

Kanawha Sand Company, Parkersburg, W. Va., goes on record as a satisfied user of their Thomas DURABLE Dredge Pump, which has been in service since late in 1953.

Kanawha Sand Company is pleased with their Thomas Pump on account of its extremely long life. All the working parts of this Thomas Pump are made of GENUINE Dependable Thomas Ni-Hard. This material plus the unique design of Thomas Pumps is responsible for the installation of hundreds of Thomas Pumps the past few years in all sections of the country, replacing pumps of many different makes.

Actual production experience of Thomas customers proves over and over again the Thomas slogan, which has become axiomatic:

"YOU CAN NOT BUY AT ANY PRICE A MORE DURABLE PUMP FOR SAND AND GRAVEL. YOU CAN NOT BUY ONE THAT WILL MAKE YOU AS MUCH MONEY."

Available in range of sizes from 6" to 16" discharge

Above: Series NOL, 15", Thomas Pump as used by Kanawha Sand Co.

Below: Kanawha Sand Company dredge "West Virginian", equipped with Thomas DURABLE Dredge pump since 1953.

KANAWHA SAND COMPANY
OHIO RIVER WASHED SAND AND GRAVEL

TELEPHONE HU 5 5481
PARKERSBURG · W · VA ·

October 21, 1958

Thomas Foundries
Birmingham, Alabama

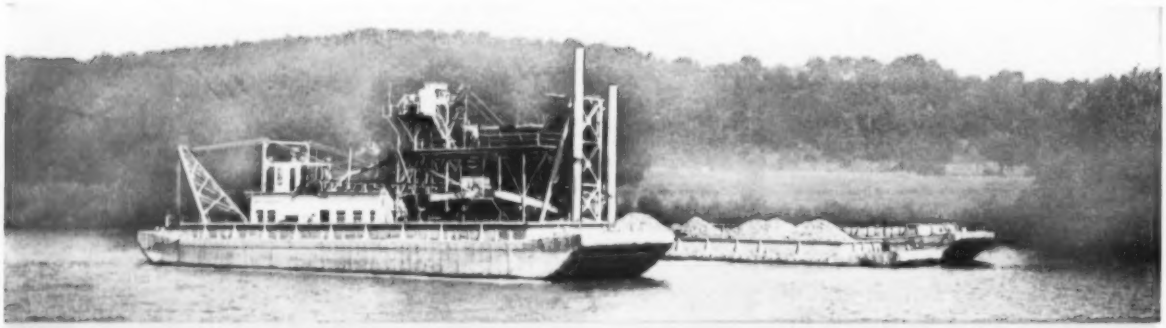
We are enclosing a photograph of our dredge West Virginian. This dredge is equipped with a Thomas series NOL pump adapted for a 10" suction and 14" discharge. We also use a Thomas trash separator which aids greatly in producing quality material.

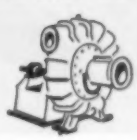
We produce an average of 400 tons of finished product per hour of dredging, and since the pump was installed in 1953, we have used only two Ni-Hard shell liners and few other parts.

Very truly yours,

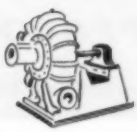
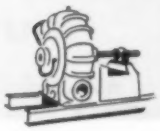
J. T. Oakley
Executive Vice President

JTW:mhn
Enc.





THOMAS FOUNDRIES Inc.
P. O. BOX 1111, BIRMINGHAM, ALABAMA

A big machine for a big job

Manitowoc dragline brings down 50 foot face of gravel . . . then re-handles the material by dredging 45 to 50 feet below water to supply Standard Slag Company washing plant.

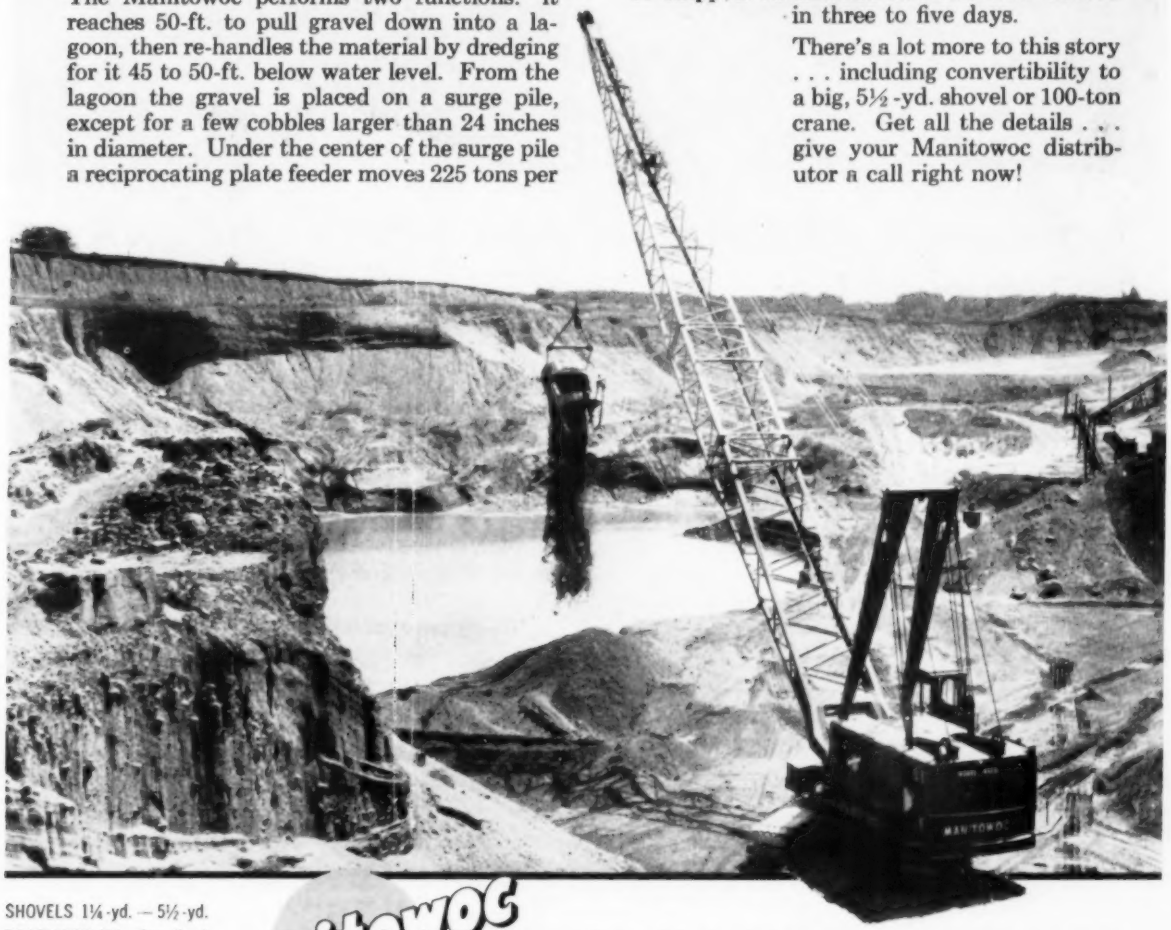
The Standard Slag Company's Crystal Springs washing plant near Massilon, Ohio runs through 225 tons of gravel an hour to operate at top capacity. A Manitowoc Model 4500 dragline with a 5-yd. bucket is used as the primary producer of gravel for the plant. The drag is diesel-powered and is equipped with a 140-ft. boom, providing the great reach needed on this tough job.

The Manitowoc performs two functions: it reaches 50-ft. to pull gravel down into a lagoon, then re-handles the material by dredging for it 45 to 50-ft. below water level. From the lagoon the gravel is placed on a surge pile, except for a few cobbles larger than 24 inches in diameter. Under the center of the surge pile a reciprocating plate feeder moves 225 tons per hour of gravel to an 1,800-ft. conveyor system leading to the processing plant.

The Manitowoc Model 4500 dragline is ideally suited to big scale operations of this sort because it combines unusual stability and long reach with a fast cycle and direct power flow. Modern, balanced design has produced a dragline with a big capacity, yet with the mobility of a two or three-yard rig.

And note that the Model 4500 has no clumsy electric cable trailing behind . . . no expensive, troublesome power installations to maintain. Low cost, easily-understood diesel-power lets you move quickly from one job location to another without the problem of available power. Moving long distances is just as simple, because this modern Manitowoc can be shipped on railroad flat cars and erected in three to five days.

There's a lot more to this story . . . including convertibility to a big, 5½-yd. shovel or 100-ton crane. Get all the details . . . give your Manitowoc distributor a call right now!



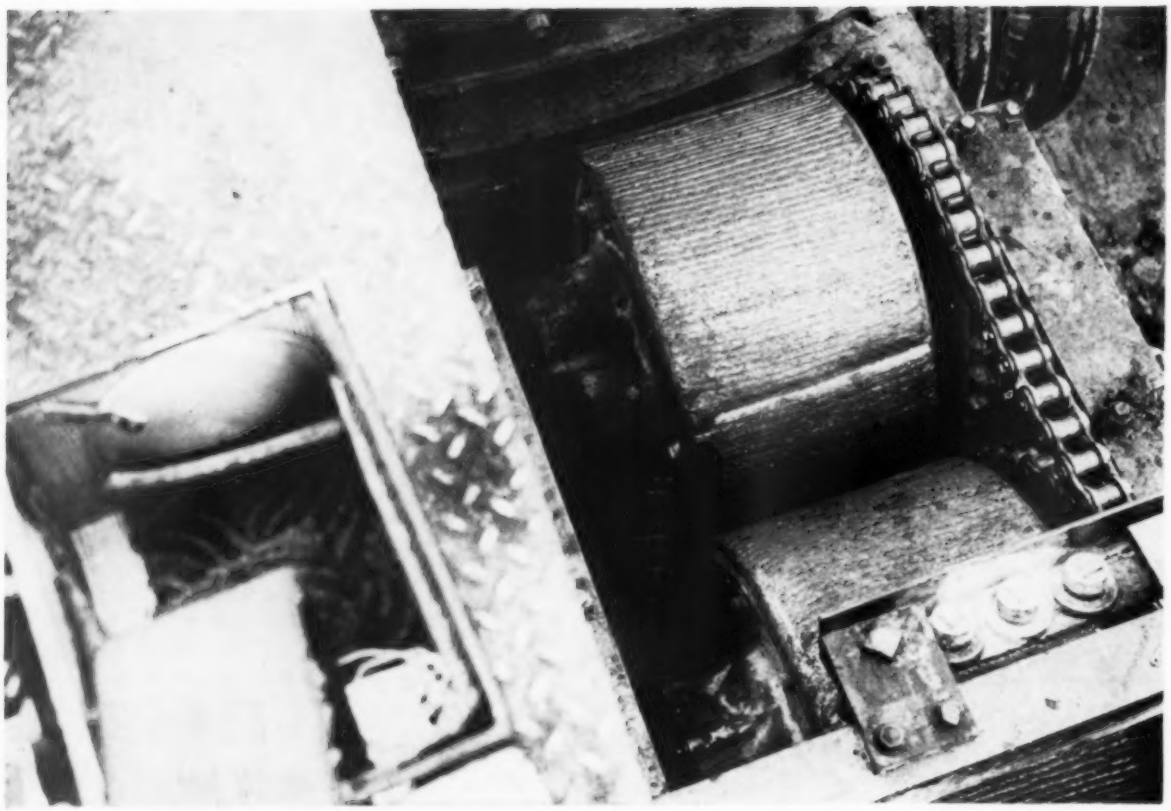
SHOVELS 1¼-yd. — 5½-yd.
DRAGLINES 1¼-yd. — 6-yd.

Manitowoc

MANITOWOC ENGINEERING CORP.

(A subsidiary of The Manitowoc Company, Inc.)

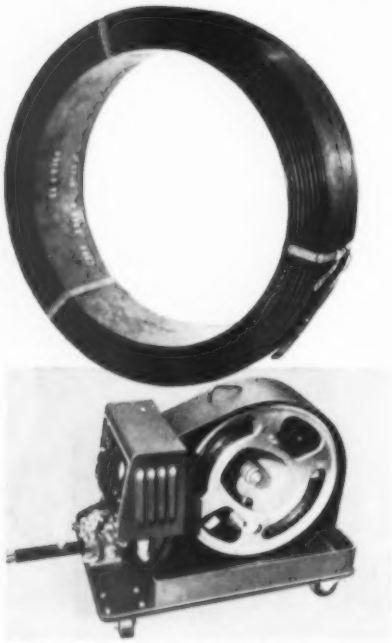
MANITOWOC, WIS.



CRUSHER EQUIPMENT FOR SUPER HIGHWAYS

maintained easier with

STOODY SEMI-AUTOMATIC HARD-FACING



Stoody Semi-Automatic wires are available in a variety of alloy types for all job requirements. They can be fed through most standard semi-automatic welding machines.

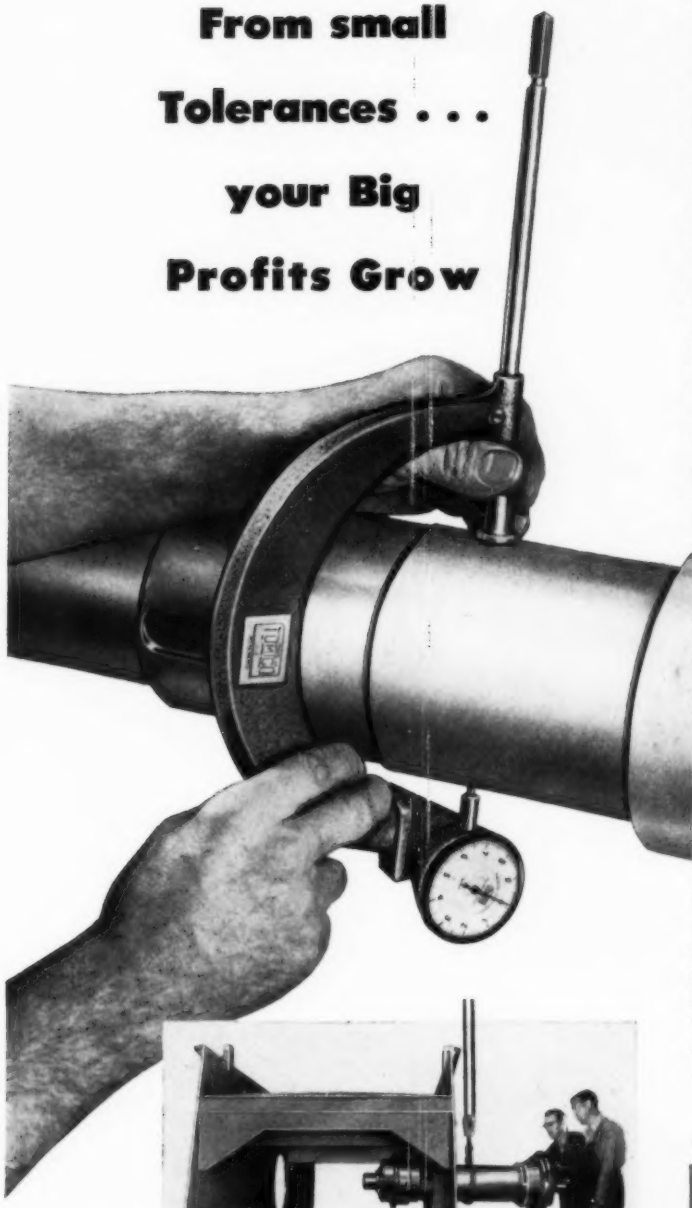
Near Grants, New Mexico, a new super highway is under construction. Keeping crushers in operation to supply aggregate is a tough job. Roy Hartman, the welder, states, "I like to hard-face with the Semi-Automatic machine. On crusher rolls, I can lay down from 7½ to 10 pounds of Stoody 100 per hour but only about half that much when applying manual electrodes—even though working hard. Semi-Automatic hard-facing makes my job easier."

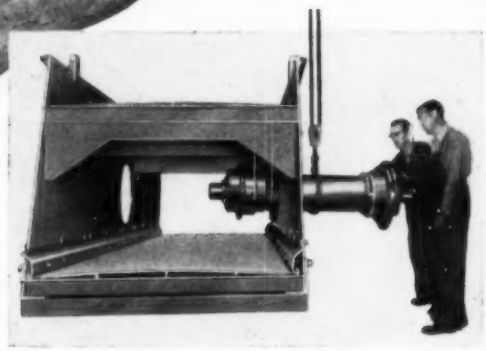
To lick the toughest jobs fast, with less wear-and-tear on yourself, just try Stoody Semi-Automatic Hard-Facing. A variety of alloy types cover all hard-facing requirements. If you'd like a demonstration in your own plant on your work, simply ask your nearest Stoody Dealer (see the "Yellow Pages" of your phone book) or write direct to the company.

STOODY COMPANY

11940 East Slauson Avenue • Whittier, California

From small Tolerances . . . your Big Profits Grow





OPERATION SCREENING EFFICIENCY

The transition from tolerances to profits is made very easily with SECO TWIN BEARING Screens. We at SECO realize that your rising profit curve is dependent upon the tonnage you can process in any given period. The equipment you utilize will govern to what extent you can meet and maintain vigorous production demands in peak periods.

SECO Screens are designed to meet and exceed these high production quotas. The quality is controlled from the drawing board to your specific installation. Exceedingly close tolerances are maintained to give your screens a longer productive life with a very minimum of downtime.

Every moving part is virtually "tailored to fit" to tolerances of ten-thousandths of an inch . . . for the smooth precision of a watch movement and the strength of a Sherman tank.

ECCENTRIC SHAFT Engineered with a greater eccentricity to retain the required vibration amplitude for peak efficiency under heavy loads. The SECO TWIN BEARING Shaft is made of a premium-grade steel in heavier than normal section to withstand the stress of amplitude and speed which results in better screening.

BEARINGS are oil lubricated and oil is **retained** in bearing cavity through the use of effective oil seals on both sides of the bearing. Bearing housings are machined to tolerances measured in the thousandths of an inch. All bearing housings are equipped with pressure release valves.

Exacting tolerances and rigid specifications incorporated into every SECO Screen are your assurance of longer life and a more profitable operation. Let us show you how SECO TWIN BEARING Screens can help you stay a step ahead of production by accomplishing tomorrow's screening job . . . today.

Send for TWIN BEARING booklet TB-21

SECO
TWIN BEARING
SCREENS

SCREEN EQUIPMENT CO., Inc.
BUFFALO 25, NEW YORK

NEW MODEL H-90

Full 9,000 lb. carry capacity and 21,000 lb. breakout force

One way to make a profit in spite of keener competition and rising production costs is to make sure your operators have the most modern and efficient machines available.

The Model H-90 "PAYLOADER", for example, will make your manpower more productive. This improved version of the famous Model HO is the newest of the modern 4-wheel-drive "PAYLOADER" line. It features new highs in carry capacity, breakout force, operator visibility and engine power that add up to more production at lower net cost per yard.

Full 9,000 lb. Carry Capacity

The Model H-90 has more Carry Capacity than comparable machines weighing as much as 3,000 lbs. more. This *Carry Capacity* of 9,000 lbs., means that you can use buckets up to 4 cu. yd. (SAE Rating) depending on the weights of materials to be handled. The Static Capacity is 15,000 lbs. A breakout force of 21,000 lbs. — almost as much as the machine's weight — is available at the bucket cutting edge.

Choice of Four Engines

You have a choice of four heavy-duty engines: a 125 hp Hercules gasoline, and three diesels — 122 hp Cummins, 162 hp Cummins Supercharged and 153 hp G.M.C.

Better Traction

Power-transfer differentials on both axles make 4-wheel-drive even more effective. If one wheel encounters loose or slippery footing and tends to spin, more power is automatically applied to the opposite wheel. Because tractor-shovels of this size and capacity are subjected to greater-than-average stresses and strains, the planetary axles of the H-90 are special extra-heavy-duty type.

Easy Operation, Long Life

Power-shift transmission with 3 speeds forward *and* 3 speeds reverse, torque-converter, twin-cylinder power-steer and 4-wheel power brakes assure fast, easy operation all day long. Sealed front-wheel brakes prevent scoring and glazing. Large oil-bath air cleaners and cartridge-type oil filters protect the engine, hydraulic oil and transmission-torque converter oil.

More for Your Money

Your Hough Distributor will be glad to show you why you get more for your money in the new Model H-90 or *any* "PAYLOADER" model. Ask him about Hough Purchase and Lease Plans too.

THE FRANK G. HOUGH CO.
750 Sunnyside Ave., Libertyville, Ill.

Send data on new Model H-90

Name _____

Title _____

Company _____

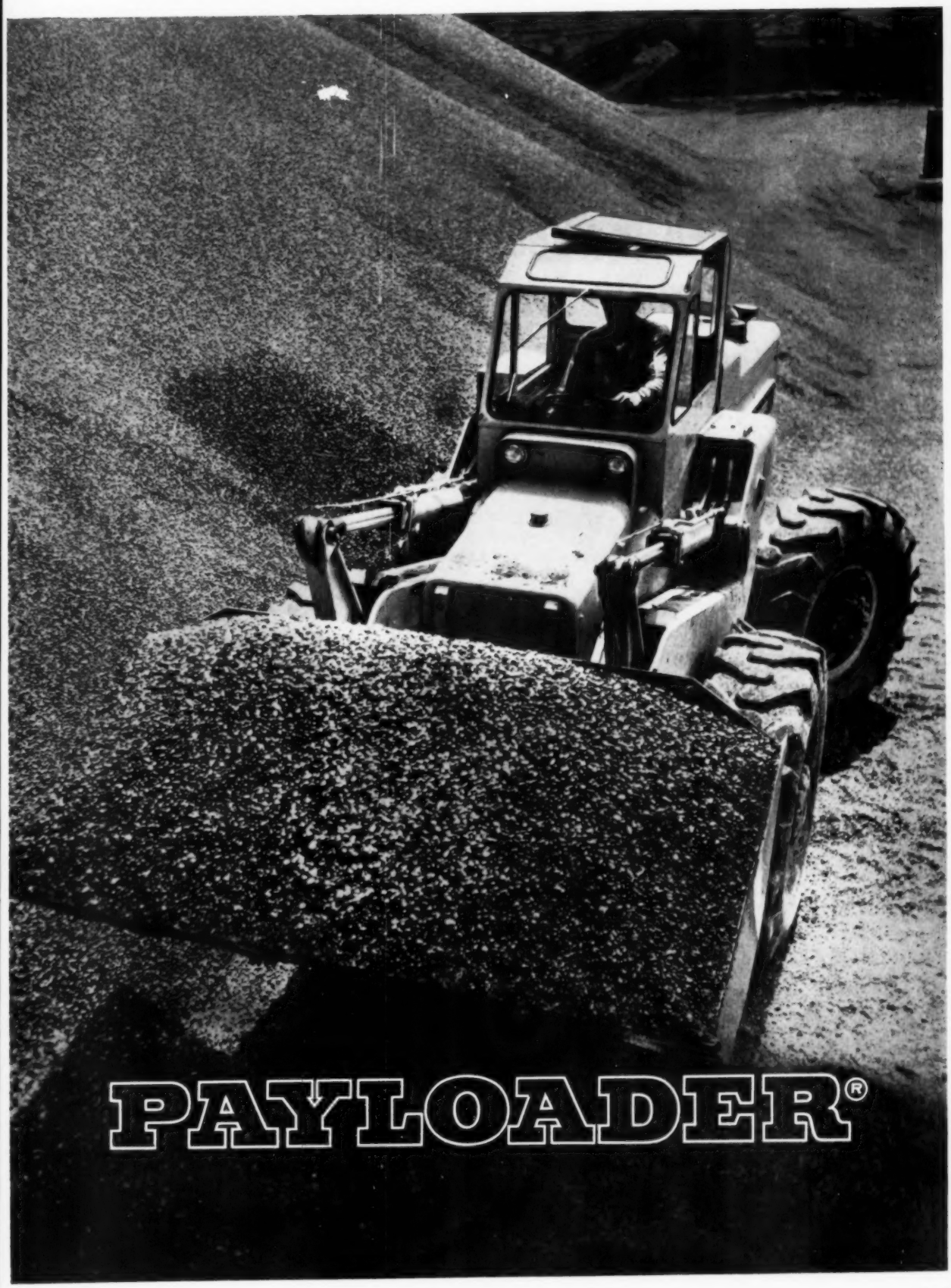
Street _____

City _____ State _____

4-B-4

HOUGH®

THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY

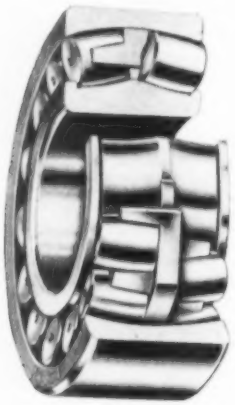


Enter 176 on card, page 139

SKF engineering solves major bearing problems

NEW SCREEN BEARING OFFERS THE CAPACITY AND FATIGUE LIFE NEEDED TO BOOST VIBRATING SCREEN PRODUCTION

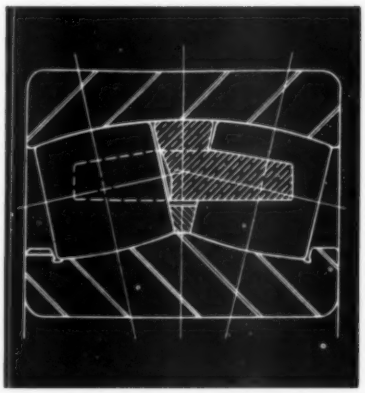
Designers and users of vibrating screens continually look for ways to increase operating capacity. Their requirements create a special bearing problem—because of the combination of high loads and eccentric motion to which the bearings are subjected.



This is the new SKF screen bearing, now being produced in the fourteen most widely-used sizes.

A new screen bearing, developed by SKF, solves the problem. This bearing has the long rollers and high capacity of the "C" type spherical roller bearing SKF introduced in 1953. *It provides 40% greater load-carrying capacity and 3 times longer fatigue life than previous types.* And its specially-designed cage withstands the high eccentric motion peculiar to vibrating screens.

This cage is made of centrifugally cast bronze and has axially drilled and reamed pockets of a shape closely conforming to that of the rollers. Its spherical OD conforms to the contour of the outer ring sphere. This provides greater cage contact area, thereby reducing the unit stresses. It also eliminates lubrication problems as the cage is supported in the outer ring's spherical surface where ample lubrication is available. This cage is symmetrical and one piece construction assures dynamic stability. 5911



Drawing shows long rollers and close relative conformity of roller contour to ring contour in screen bearing design.

The new bearing is interchangeable with SKF 223 Series bearings used on screens in mines, quarries, steel mills, chemical and paper plants. For full details, send for Catalog No. 466. Write or call the nearest SKF distributor, sales office or SKF Industries, Inc., Philadelphia 32, Pa.

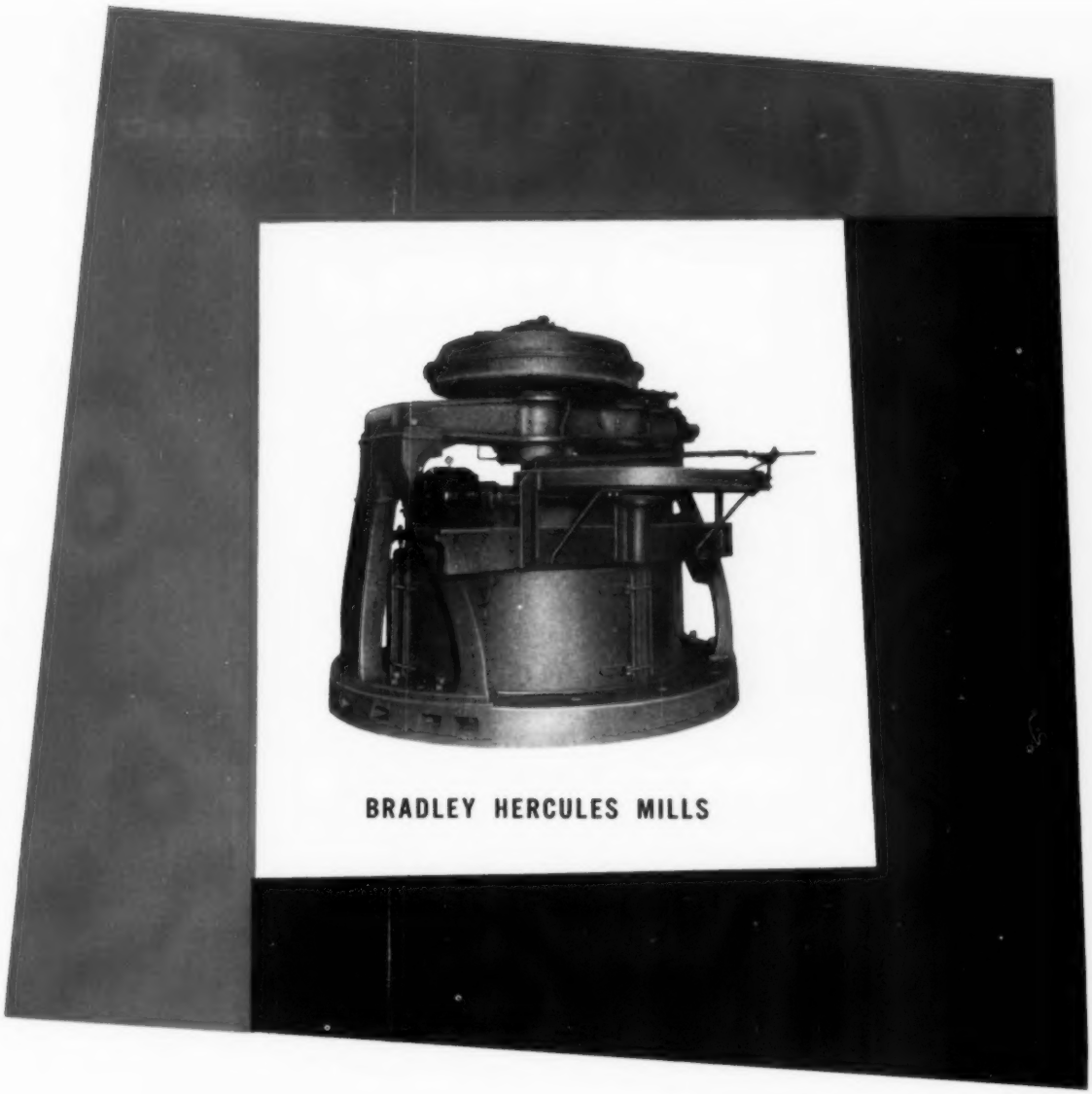
Spherical, Cylindrical, Ball, and "Tyson" Tapered Roller Bearings

EVERY TYPE—EVERY USE

SKF®

SKF INDUSTRIES, INC. PHILADELPHIA 32, PA.

®REG. U.S. PAT. OFF.



BRADLEY HERCULES MILLS

HOW TO INCREASE CEMENT PRODUCTION UP TO 50% . . .

The capacity of an existing tube or compartment mill can be increased up to 50% or even higher simply by installing a Bradley Hercules Mill as a preliminary pulverizer on either the dry raw or finish side. Yet this increased production of cement raw material or finished cement is obtained at no increase in horsepower consumption per ton or barrel produced. The Hercules automatic electrical feed control eliminates manual operation. Rugged construction . . . dustless operation . . . easy accessibility to grinding parts keep maintenance costs at an absolute minimum. That's why so many in the cement industry rely on the Hercules Mill for increased production of finished material.

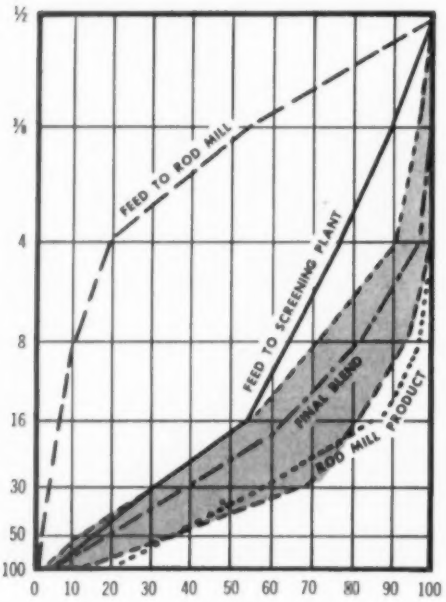
See Chemical Engineering Catalog or for complete information, write for Catalog No. 63

BRADLEY PULVERIZER CO. LONDON ALLENTOWN, PA. BOSTON

superior grinding equipment since 1891

KENNEDY ROD MILLS produce

Owners and operators are unanimously enthusiastic over the performance of KENNEDY Rod Mills in the manufacture of sand. The simplicity of the circuit, the ease and low cost of upkeep and the ability of the KENNEDY Rod Mill to produce large tonnages of sand which meets the most rigid specifications are among the important qualities which make KENNEDY Mills outstanding in this operation.



This screen analysis, made during a production run of a KENNEDY 4 x 10 Rod Mill circuit, shows how effectively the final blend meets specifications.

Consult KENNEDY *for full information on the production of sand with the* KENNEDY *Rod Mill.*

Primary & Secondary Gyratory Crushers • Jaw Crushers • Roll Crushers • Impact Breakers • Hammer Mills • Rod & Ball Mills • Kilns • Dryers • Screens

specification sand at less cost

◀ Dan Grow, Plant Manager, Refractory Sand Co., Andreas, Pa.

"We are called upon to make unusual specification sands by the various refractory companies. Without our Kennedy Rod Mills this would be an impossibility. For versatility and reliability you can't beat a Kennedy Rod Mill."

John H. Mowery, ▶
Plant Manager,
Central Builders Supply Co.,
Sunbury, Pa.

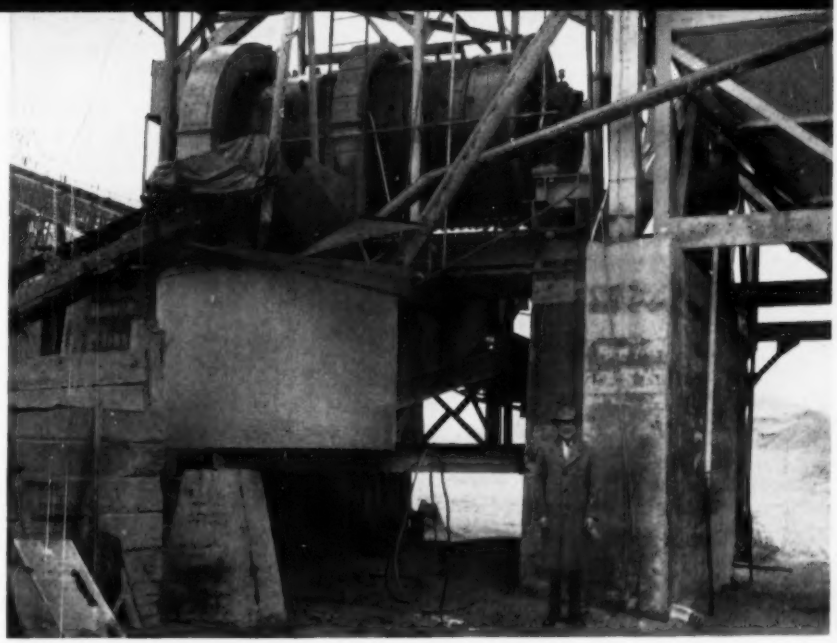
"We are constantly amazed at the high capacity our Kennedy Rod Mill gives us at the exact gradation we want."

◀ Neal McMullen, President of Sheesley Minerals, Inc., Kunkletown, Pa.

"We are one of the very few companies in our area capable of making sand to the rigid State specifications. Our Kennedy Rod Mill is, in large measure, responsible for this ability to produce and hold gradation. We investigated thoroughly before buying and are now certain it pays to own the best."

Dr. L. T. Hempt, ▶
Hempt Bros.,
Camp Hill, Pa.

"We have tried other methods of manufacturing sand, but experience has proved to us that processing in a Kennedy Rod Mill is the only economical way to do it. Kennedy Products are good and Kennedy Service is even better."

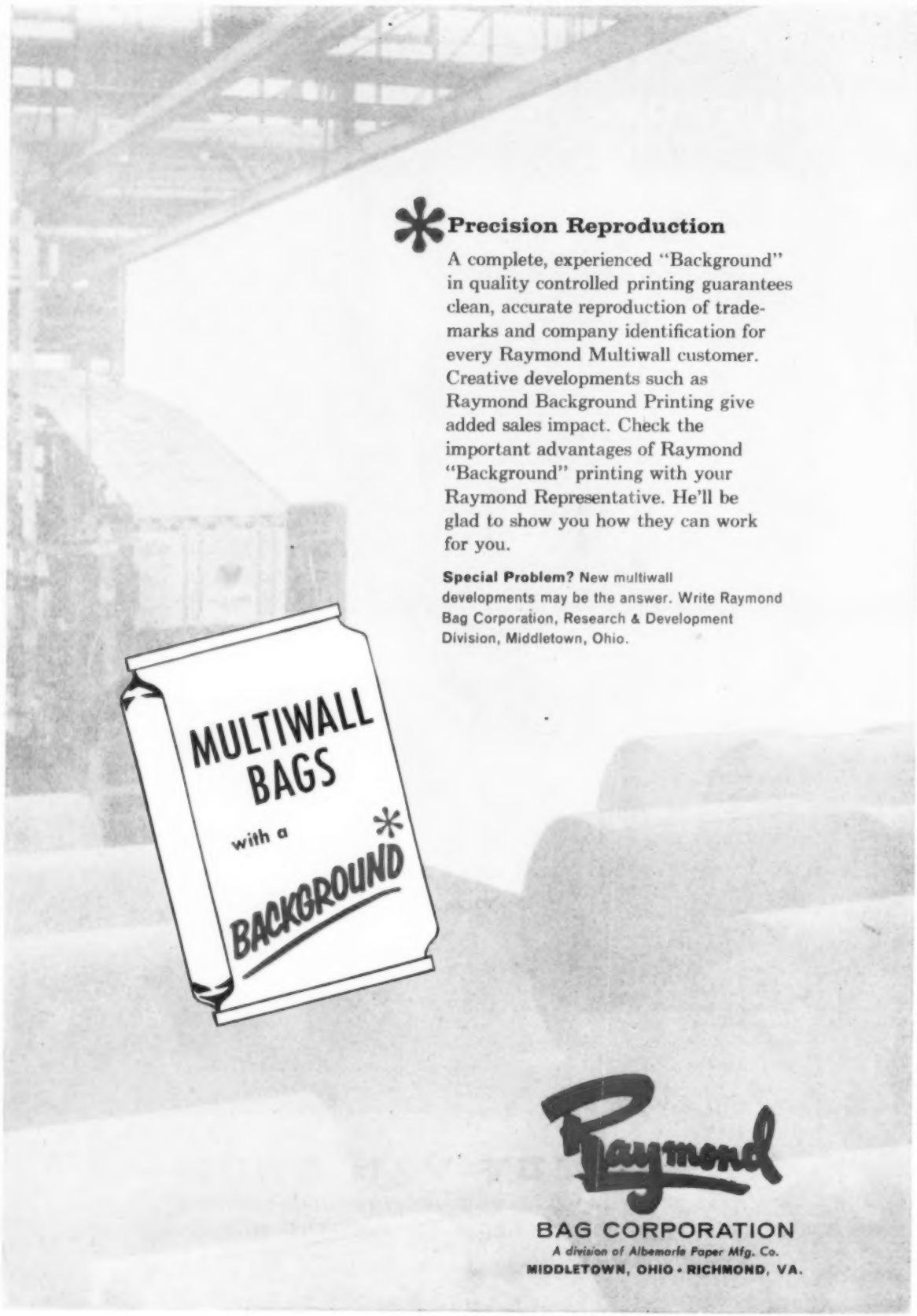


KENNEDY VAN SAUN

MANUFACTURING & ENGINEERING CORPORATION

405 PARK AVENUE, NEW YORK 22, N.Y. • FACTORY: DANVILLE, PA.

• Mechanical and Pneumatic Conveyors • Complete Crushing, Lime, Cement & Carbon Paste Plants • KENNEDY Research & Testing Service.



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Special Problem? New multiwall developments may be the answer. Write Raymond Bag Corporation, Research & Development Division, Middletown, Ohio.

Raymond
BAG CORPORATION
A division of Albemarle Paper Mfg. Co.
MIDDLETOWN, OHIO • RICHMOND, VA.

Any way you look at it...

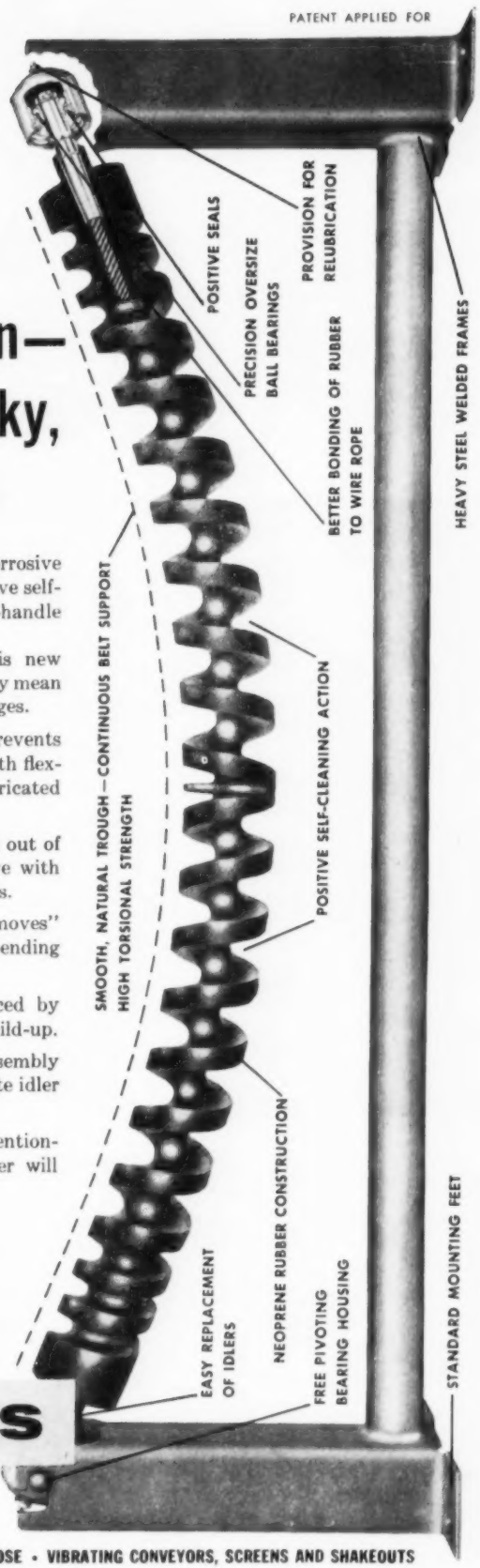
New Rubber Spiral Idler Defies Corrosion, Abrasion—Prevents Build-up of Sticky, Hard-to-Handle Materials

Here's the conveyor idler built to last longest in punishing corrosive atmosphere or extreme abrasive service! What's more, its exclusive self-cleaning rubber spiral prevents build-up of sticky, hard-to-handle materials!

The numerous design and construction advantages of this new Hewitt-Robins idler are shown in the illustration. Here's what they mean to you in terms of cost-cutting, time-saving, operating advantages.

- **LONG LIFE.** Neoprene spiral, completely covering wire rope, prevents attack in corrosive atmosphere. Uninterrupted spiral gives smooth flexing, maximum strength. Precision sealed bearings can be relubricated for still longer life.
- **SELF CLEANING.** As the spiral turns, it "works" any material out of the grooves as they change shape. This action is most effective with sticky materials which tend to build up on common types of idlers.
- **CONTINUOUS BELT SUPPORT.** The new rubber spiral design "moves" along the entire width of the belt; therefore, pinching and sharp bending of the belt are eliminated.
- **SELF TRAINING.** Belt training problems are greatly reduced by readily conforming rubber spiral, and by elimination of material build-up.
- **EASY REPLACEMENT.** The spiral, wire rope, and bearing assembly simply lifts out of its brackets—no tools are needed. The complete idler fits standard conveyor stringers.
- **TRUE OPERATING ECONOMY.** Under conditions where conventional idlers fail prematurely, the Hewitt-Robins rubber spiral idler will pay for itself many times over.

Deliveries of this revolutionary new idler are now being made in 18, 24, 30, and 36 inch belt sizes. In addition to the type shown, it is also furnished with a spreader frame for use in wire rope conveyor systems. For further information check your H-R distributor, or write Hewitt-Robins, Stamford, Connecticut. Ask for Bulletin 3-24.



HEWITT-ROBINS

THE NAME THAT MEANS EVERYTHING IN BULK MATERIALS HANDLING SYSTEMS . . .

CONVEYOR BELTING AND IDLERS • POWER TRANSMISSION DRIVES • INDUSTRIAL HOSE • VIBRATING CONVEYORS, SCREENS AND SHAKEOUTS

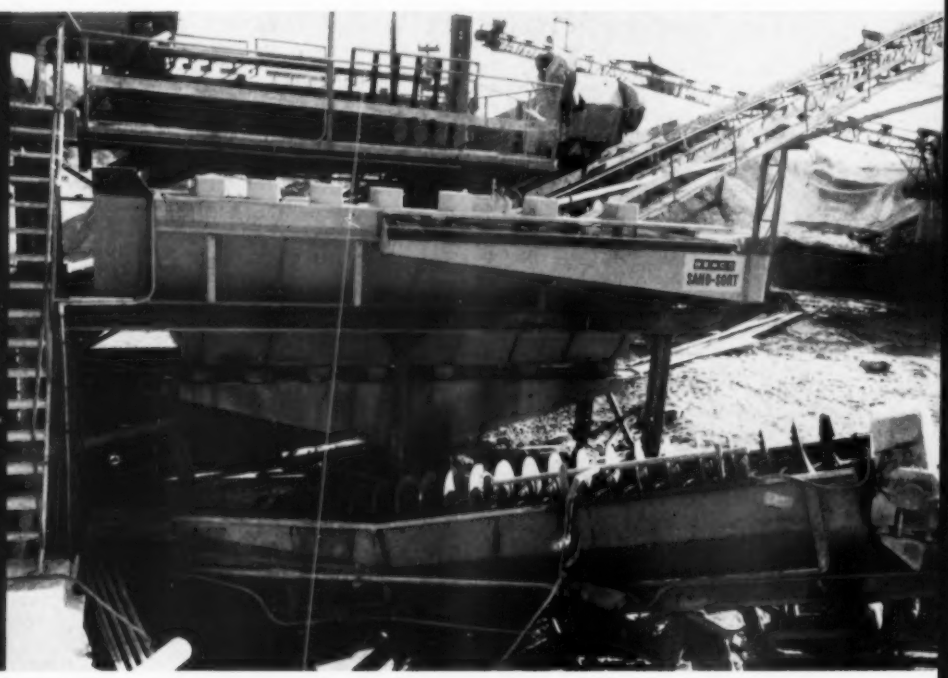
NOW!

THE NEW WEMCO SAND SORT

Free-settling classifying tank

- Separates sands into desired grades and sizes.
- Removes large volumes of excess water.
- Allows sand blending for varied specifications—removal of excess in any size fractions.
- New automatic controls provide maximum flexibility and dependability in operation.

- Controllable valve discharge to meet requirements of sand fraction.
- Spring-loaded valve closure prevents spillage in case of power supply failure and on shut down.
- Individual control of valve mechanisms . . . adjustable during operation.



Wemco Sand Sort Installed at H. G. Fenton Materials Company . . . San Diego, California

The Wemco Sand Sort is now ready after long and detailed studies . . . with thorough analysis of job requirements . . . careful engineering design . . . and on-the-job proving.

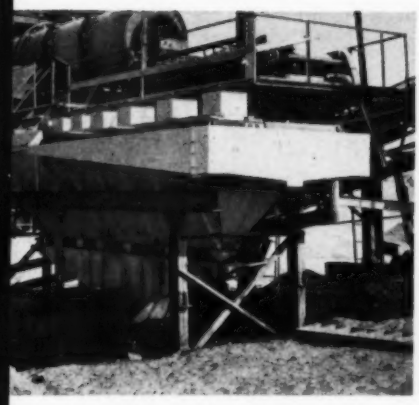
The Wemco Sand Sort design takes into account well-known differences in the characteristics of sand in different size fractions. The action of each sand discharge valve is completely controllable to insure optimum trouble-free operation through *all* size ranges.

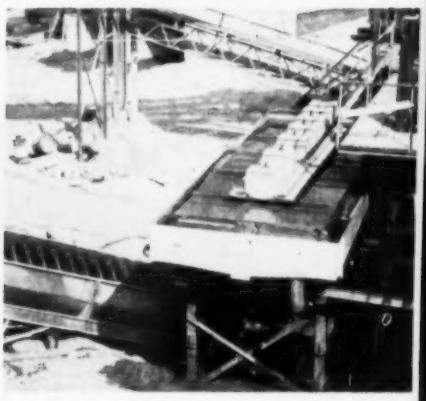
And performance is the real pay-off! You'll find in the new Wemco Sand Sort a machine that will do *more* for you, do it *better* and do it for *less*. An operating stand-out in every detail!

WEMCO®

a division of
Western Machinery Company
650 Fifth St., San Francisco, Calif.
and throughout the world

DESIGNED FOR THE JOB! PROVED ON THE JOB!





The Wemco Sand Sort now joins the Wemco line of quality aggregate treating equipment.

HOW IT WORKS

- Sand-water slurry enters at one end of V-bottom classifying tank. Sand fractions settle out according to their natural settling rate and size. Slimes and water overflow into launder.
- Sands are drawn off through discharge valves along bottom of the tank and can be blended to meet specifications by combining all or part of the discharges from different valves and diverting to one or more flumes—two or three specifications of sand can be produced at one time if desired.
- Discharge valves are automatically controlled in accordance with the depth of accumulated sand. Rate of opening and closing of each valve can be easily adjusted.
- When desired, valves can be individually and manually operated at each control unit box without interference with the operation of other mechanisms.

GET ALL THE FACTS NOW!

WEMCO
650 Fifth Street
San Francisco, California

Please send complete information on the new Wemco Sand Sort.

NAME TITLE

COMPANY

ADDRESS

CITY STATE

Geared by FULLER . . .

Rhodes & Jamieson keeps construction materials on the go

Rhodes & Jamieson, Oakland, California, produces about 5,600 cubic yards of wet mix construction material every day. To keep this "perishable" material moving on schedule, the company runs each bottom dump truck in its large fleet on two 9-hour shifts, and gives each a preventive maintenance check every week.

Tough schedules and tougher hauling conditions call for the best in equipment. That's why Rhodes & Jamieson officials are so pleased with the performance and reliability of the Fuller Transmissions in their big fleet. Typical of the equipment used by the company are the following trucks:

80 International RF-192 ready-mix trucks with 5 and 7-yard mixers, equipped with Fuller 5-C-65, 5-speed Transmissions.

22 International D-405 double bottom hopper dump trucks, with Fuller R-96 10-speed ROADRANGER® single-stick Transmissions.

3 International RD-450 6x6 C.O.E. units with 7-yard mixers, equipped with Fuller R-46 semi-automatic ROADRANGER Transmissions, featuring 8 closely-spaced forward speeds, shifted by a single lever.

For dependability, ease of operation and economy, Rhodes & Jamieson specifies Fuller Transmissions. There is a Fuller for *your* job. Ask your truck or equipment dealer for more information on the Fuller Transmission best suited to meet your specific operating requirements.

FULLER TRANSMISSION DIVISION MANUFACTURING COMPANY
KALAMAZOO, MICHIGAN
Subsidiary EATON Manufacturing Company

Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla. Automotive Products Company, Ltd., Brock House, Langham Street, London W.1, England, European Representative

Marion 111-M Does Double Duty

A Marion 111-M is "doing a good job on two jobs" at a Texas sand and gravel plant.

Half of its job is to handle the stripping to keep the sand and gravel bank uncovered.

Then it handles all of the loading for a plant that is working two shifts to keep pace with expanded operations.

The Marion 111-M is equipped with a 5-yard bucket on a 90-foot boom, making it one of the biggest machines in this type of work in the Texas area.

The 111-M is a diesel machine, capable of traveling and working almost anywhere. It combines all of the advantages of a diesel machine with the smooth, fast swing action of Ward-Leonard electric control. The diesel power unit drives a generator for the electric swing motors; there are no swing clutches to overheat and no complicated maintenance problem.

Get the complete story on the Marion 111-M and the tough jobs it is handling throughout the world. Your nearest Marion Distributor is the man to see.

You get **MORE** *with* **MARION**

MARION POWER SHOVEL CO. • MARION, OHIO
A Division of Universal Marion Corporation

Send me information about MARION ..... yard shovels, ... yard hoes and ..... ton cranes (☐ crawler mounted ☐ truck mounted).
☐ Have a salesman call.

Name ..... Title .....

Company .....

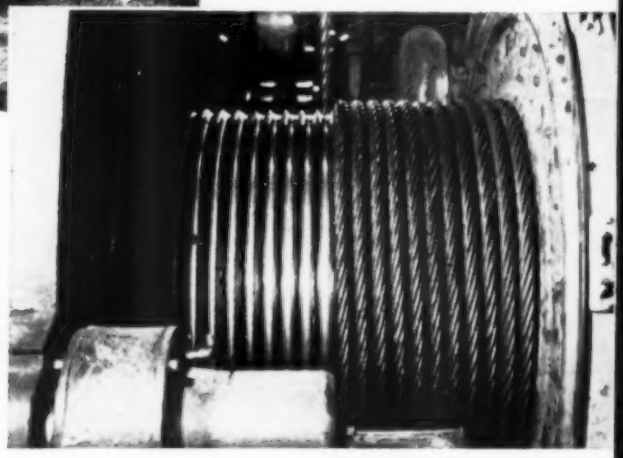
Street .....

City ..... Zone ..... State .....

2⅛" Tiger Brand hoist ropes going through the boom point sheaves.

40-cubic-yard shovel stripping overburden at the Little Sister Mine of the Truax Traer Coal Company, St. David, Illinois.

Main hoist drum with well-lubricated Tiger Brand Rope in excellent condition after long service.



Little Sister Shovel has big "muscles" of USS American Tiger Brand Wire Rope

This 40-cubic-yard shovel, owned by the Truax Traer Coal Company, has been removing overburden at the Little Sister Mine near St. David, Illinois, for more than nine years. The hoist line is a 550-foot, 2⅜-inch diameter Tiger Brand Wire Rope, and the four boom supports are also Tiger Brand.

During this period, millions of cubic yards of rock and earth have been moved, and the Tiger Brand Wire Ropes have given long service life and dependable operation.

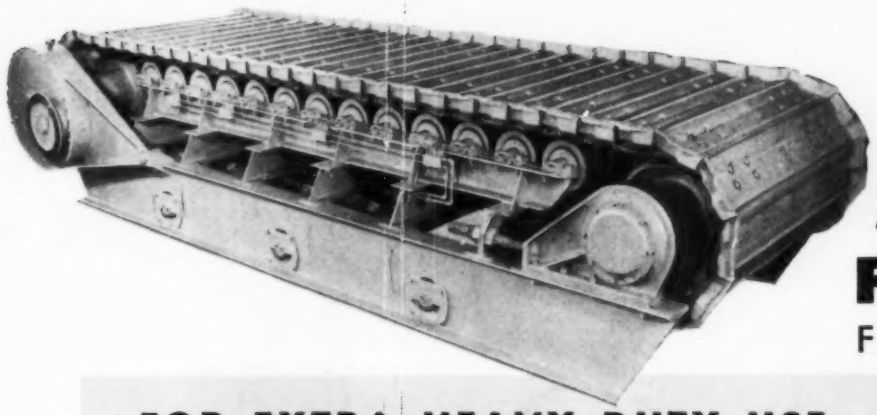
Since this 40-cubic-yard shovel went into service, we have seen the size of big shovels advance to 55, 60 and 70 cubic yards . . . and most of these big strippers are equipped with American Tiger Brand Wire Rope. Why? Because Tiger Brand is quality-controlled from ore mines to finished product under the direction of one of the finest wire rope engineering staffs in the country. They can utilize any of the basic research being conducted by United States Steel Corporation. What's more, they have unsurpassed plant facilities to produce the largest or the smallest wire rope you need. That's why Tiger Brand gives you longest service at least cost.

Write now, for our latest booklet on wire rope. American Steel & Wire Division, Rockefeller Building, Cleveland 13, Ohio.

USS and Tiger Brand are registered trademarks

American Steel & Wire Division of USS United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors • United States Steel Export Company, Distributors Abroad



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APRON FEEDERS

FD-4 and FD-8

FOR EXTRA HEAVY DUTY USE

- Uses Mass Produced Standard Crawler Tractor Parts
- Short Pitch, 8" on FD-8, 6-¾" on FD-4, provides more even feed.
- Decks of Cast Manganese or Formed Alloy Steel
- Large Diameter Head and Tail Shafts
- Anti-Friction Self-Aligning Bearings
- Centralized Lubrication Available
- Uses NICO Shaft Mounted Reducer . . .
  Eliminates open gearing and lubrication problems

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SUBSIDIARY OF PETTIBONE MULLIKEN CORP., CHICAGO 51, ILLINOIS

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KNOW HOW

More Experience Means a Better Job

. . . and Southern Tire Company—one of the nation's oldest large tire retreaders—has over 55,000 tires worth of experience in expert retreading and repair service. And speaking of service, Southern Tire's fast pickup and delivery service at your job site . . . after work hours . . . greatly reduces downtime costs and saves you important time and money. Regardless of what your particular job requirements are, Southern Tire can supply the size and tread design best suited to your needs. Whether you operate light or heavy equipment, you can get new tire mileage at approximately half the cost, when you call on Southern Tire for your retreading needs.

Modern 3-Sectional Molds. No buffing to breaker strips regardless of growth.

Rock Service, Traction Types or Rib Treads, and all sizes available.

Always Deal With an Independent — The Pioneers of The Industry. More Experience Assures You of Better Service.

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DRILL 9". HOLES·WITH THE JOY 59-BH CHAMPION

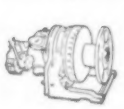
This world-famous pioneer rotary-air-blast-drill has adopted many of the features of its big brother, the Super-Heavyweight, to give you these advantages:

MORE STABLE DRILL STRING through use of round pipe . . . BETTER AIR CIRCULATION and cuttings removal . . . FASTER DRILLING—faster retraction of hydraulic feed averages total of only 3 minutes on a 51′ hole . . . EXTENDED 55′ MAST permits drilling 50′ hole without adding pipe . . . BETTER MOBILITY —hydraulically raised and lowered mast is left assembled during long moves . . . 9″ HOLE allows wider hole spacing, economical use of large diameter powder.

This all adds up to new records in low cost per ton of rock. Get the whole story on the 59-BH. Write to ***Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*** In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario.

Write for Bulletin 168-26

JOY . . . EQUIPMENT FOR MINING . . . QUARRYING . . . CONSTRUCTION



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PAVING BREAKERS • SHEETING DRIVERS • DRIFTERS • PORTABLE HOISTS • FANS AND BLOWERS • PORTABLE SAFETY LIGHTING

Manufacturers' News

Dr. N. B. Sommer

G. C. Holton

DR. N. B. SOMMER has been appointed manager of American Cyanamid Company's explosives and mining chemicals department and GEORGE C. HOLTON has been named assistant to the general manager, Organic Chemicals Division.

Dr. Sommer, formerly assistant to the executive vice-president, has been with Cyanamid since 1944 when he joined the company as a research chemist. Subsequently he became manager of the market development department of Jefferson Chemical Company, a Cyanamid subsidiary, manager of Cyanamid's new product development department, and marketing manager of plastics in the Plastics and Resins Division.

Mr. Holton, who has been with Cyanamid since 1934, has served the company's explosives department during these years as sales manager, assistant to the manager, assistant manager, and department manager.

The Macwhyte Wire Rope Company, Kenosha, Wis., has opened a new warehouse building at 144 Thalia St., New Orleans, La., to house a complete factory stock of wire rope.

ALFRED T. GLYNN has been named chief engineer of the Sturtevant Mill Company, Dorchester, Mass., filling the post vacated by the death of Edward Ingle. Mr. Glynn had served as interim chief engineer prior to his appointment in January.

ALFRED F. MANSBACH has joined The Eimco Corporation, Salt Lake City, Utah, as advertising and sales promotion manager, Tractor Division.

Mr. Mansbach comes to Eimco from Birmingham, Ala., where he has been vice-president and a member of the board of Robert Luckie & Company, Inc., a well-known advertising—public relations agency in that area. He was previously connected with Jones & Laughlin Steel Corporation and with Ketchum & Grove, Inc., both of Pittsburgh, Pa.

A. F. Mansbach

H. J. Mayer

H. J. MAYER, executive vice-president of the Western Machinery Company, San Francisco, Calif., was elected vice-president of the Associated Equipment Distributors at their annual meeting held recently in Chicago. Mr. Mayer has previously served as a regional director of A.E.D.

Active in construction and industrial equipment marketing most of his business life, Mr. Mayer has been associated with Western Machinery since 1935.

West Virginia Pulp and Paper Company, New York, N. Y., has equipped a second paper machine for producing Clupak stretchable paper, increasing total capacity for this product to more than 150,000 tons annually.

The company began manufacturing Clupak paper early in 1958, after its new No. 3 machine at Charleston, S. C., was equipped with the first extensible unit. The second unit has been installed on the mill's No. 2 machine.

"THIS LUBRICANT CUT BEARING REPLACEMENTS OVER 40%"

says—HANOVER BUILDING SUPPLY CO. of Hanover, Pa.

"Before using LUBRIPLATE, we replaced the wheel bearings in over 50% of our trucks each year. Since using it, bearing replacements have dropped to less than 10%. We have also been able to increase periods between chassis lubrications from 500 to 2000 miles. We are very happy over our change to LUBRIPLATE, and heartily recommend it to fleet operators interested in saving money."

HANOVER BUILDING SUPPLY CO.
C. O. Albright, Pres.

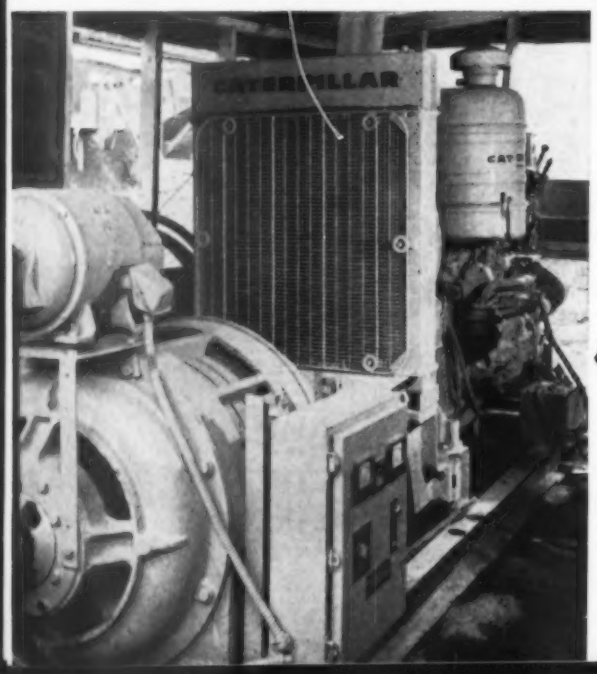
REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE GREASE AND FLUID TYPE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

LUBRIPLATE is available in grease and fluid densities for every purpose . . . LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

Enter 191 on card, page 139

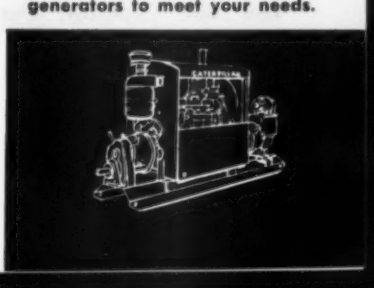
engine power
BY CATERPILLAR



Arrowhead Sand and Gravel replaced three diesels and one gas engine with this Cat D353 "Two-Handed" Diesel with belt pulley drive. The 1-for-4 substitution increased production of washed material from 85-90 yd. per hour to 120-125 yd. per hour. Arrowhead is one of the largest aggregate plants in the Duluth-Arrowhead regions of Minnesota. The Cat "Two-Handed" Engine provides direct power for an 18 x 36 inch Universal jaw crusher, a 24 x 42 inch Pioneer roll crusher, electrical power for ten motors from 1 to 60 HP, including a 60 HP motor on a Cedarapids 100 x 42 inch scalping screen. In addition, this power package supplies current for plant lighting.

This is all the room Arrowhead Sand and Gravel needs for the Cat D353 "Two-Handed" Set. You don't need any elaborate shelter with Caterpillar Engines because air, fuel and lube oil are all filtered to keep microscopic abrasive particles from getting into engine. 100% filter protection is standard—at no extra cost . . . provides longer, trouble-free life, cuts down time.

Nine basic Cat "Two-Handed" Engines range in size from the 650 HP (maximum output rating) D397 to the 75 HP D311 (Series H) . . . are matched with generators to meet your needs.



How one Cat "Two-Handed" Diesel replaced four engines

"When an engine can run the entire plant with direct drive from one end and power a large generator from the other, the engine must have built-in mechanical and engineering superiority."

—Con Robertson, President
Arrowhead Sand and Gravel
Duluth, Minnesota

Four engines were at work on Con Robertson's washing plant near Duluth. Performance and production were limited by lack of power on the primary crushers. The obvious answer was to put a larger engine on this vital jaw and roll combination.

Instead, Arrowhead installed just *one* Cat D353 "Two-Handed" Engine to replace three diesels and a gas engine. Production rose by 40 yards per hour. Efficiency went up when the power source was concentrated in one package.

There are *nine* basic Cat Engines capable of transmitting 100% power off either end of the crankshaft. They can be matched with clutch, transmission and generator to exactly match your plant mechanical-electrical requirements. The transmission or clutch can drive jaw and drum crushers through simple, direct connections. Electrical power from the generator can allow better control of screens and belts for an even flow of material.

Cat "Two-Handed" units are compact and portable. You can mount them easily on trucks away from dust and vibration. Their fast governor response makes them a natural for crusher jobs.

You can save money by taking power off both ends of a single crankshaft. Call your Caterpillar Dealer today to receive the advantages of a Cat "Two-Handed" Engine installation on your job.

Engine Division, Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

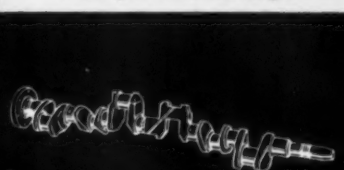
Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co

For further information send for booklet, "Now for Top Crusher Production"

Cat Crankshafts are made from pretested steel drop-forgings, with journal surfaces "Hi-Electro" hardened to *last*. Rifle-drilled crankshafts carry oil under pressure from journals to crank pins and bearings.

Your Caterpillar Dealer Engine Specialist is your diesel power consultant. He's backed by quality parts, reasonably priced, and a skilled staff of factory-trained servicemen. Call him now to avoid problems later.

Caterpillar's own foundry casts engine blocks of a special high-tensile strength alloy, 50% stronger than ordinary gray iron castings. Further rigidity and strength are provided by numerous ribs and partitions.



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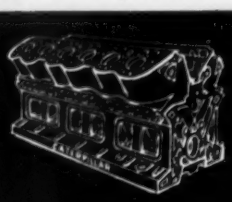

TRIAL SAMPLES

Of World-Famous WHITMORE'S Lubricants NOW IN AEROSOL SPRAY-ON CANS!

HANDI-LUBE LIQUID GEAR COMPOSITION

For open gears, sliding surfaces—exclusive formulas eliminate metal to metal contact, keep wear on the lubricant not the metal—no breakdown even after prolonged use under water—available for every climatic condition—packaged in handy 16-oz. aerosol spray-on containers or in bulk containers—send for a free trial sample.

WIRE ROPE SPRAY LUBRICANT

Exclusive formulas for lubricating and protecting wire rope, chain, springs. Penetrates to the core of wire rope minimizing internal friction and increasing usable life up to 300%—special protective qualities absolutely eliminate corrosion—non-gumming qualities reduce "carry-back"—packaged in handy 16 oz. aerosol spray-on containers or in bulk containers—send for a free trial sample.

65 YEARS OF LEADERSHIP LUBRICATING THE FOLLOWING:

- Open Gears, Dipper Sticks, Cams
- Enclosed Gear Cases
- Wire Rope and Cable
- Hydraulic Units, Torque Converters
- Roller, Ball, and Sleeve Bearings
- Speed Reducers

Est. 1893

THE WHITMORE MANUFACTURING CO.

LUBRICATING ENGINEERS

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INDUSTRIAL BROWNHOIST CORPORATION
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Appointment of HENRY B. WOODS as director of research has been announced by officials of the Hughes Tool Company, Houston, Tex. Mr. Woods has been acting director of research since the retirement of Floyd L. Scott last August, and has been identified with Hughes research and engineering departments for the last 34 years.

H. B. Woods

W. Thalacker

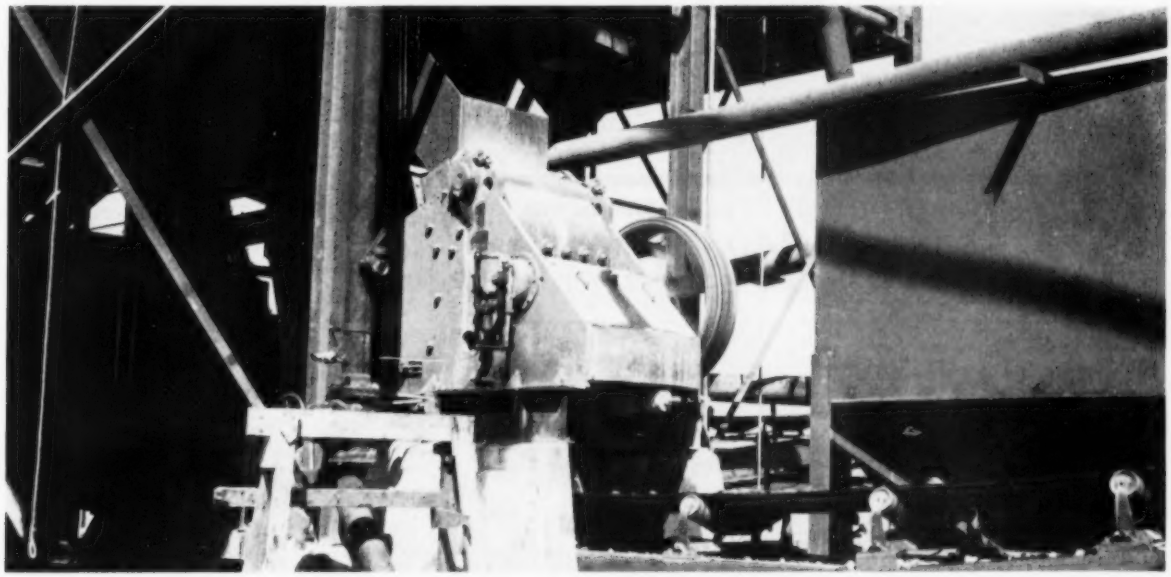
WELDON THALACKER has been appointed a sales engineer for the Eagle Iron Works, Des Moines, Iowa. Mr. Thalacker was formerly in Eagle's engineering department, and lately was responsible for supervising the construction and erection of Eagle heavy media separation plants.

A long-established firm of marketing specialists, the Jay Harper Company, New York, N. Y., has announced an expansion of services to the metals, construction, and allied industries.

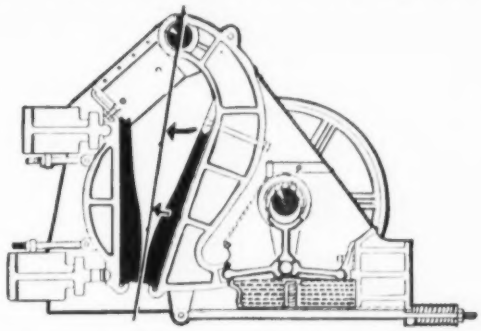
The company, which has been principally identified with the marketing of perforated steel and related items, will now broaden its interests to include all types of perforated materials, special types of machinery, rubber conveyor belting, grating, expanded metals, wire, and building products. It will handle projects in the fields of product development, marketing, sales promotion, and sales training.

The Jay Harper Company was founded in 1944 by Jay Harper Fulkerson and Mildred C. Gill. Mr. Fulkerson was president of Cross Engineering Company, manufacturer of perforated metals, serving as an officer of the firm for 34 years. Miss Gill was for many years identified with Cross Engineering's Advertising and Promotional Department.

KUE-KEN® crushes gravel for over 3 years on original jaw plates . . . "crushing without rubbing" lengthens jaw plate life at least 5 times!



Rhodes & Jamieson, Pleasanton, California, like scores of other aggregate producers, has eliminated the recurring cost of premature jaw plate replacement and expensive downtime by using Kue-Ken crushers. Kue-Ken alone operates on the advanced principle of crushing without rubbing. Even on hardest gravel, Kue-Ken jaw plates will outlast all others at least 5 times. And for crushing economy, Kue-Ken uses far less power than conventional crushers that waste power wearing out jaw plates. With its mechanism operating in a sealed, dust-tight crankcase lubricated by filtered oil, Kue-Ken crushes at higher speed for greater capacity and a more uniform product. Wear is negligible and shut-downs common to conventional crushers are practically eliminated. Automatic flywheel release prevents breakage from tramp iron. Kue-Ken crushes at the lowest cost per ton. There is a size to meet every need.



See how hinge pin is located on the center line of the crushing zone. The jaw moves in an almost straight line Rock is instantly gripped and crushed without rubbing.

KUE-KEN® CRUSHERS

"Crushing without Rubbing"

STRAUB MFG. CO., INC. 8381 Baldwin St., Oakland 21, Calif.

Jaw Crushers Gyratory Crushers Overhead Eccentric Crushers Revolving Screens
Classifiers Feeders Rib Cone Ball Mills Concentrating Tables Vibrating Screens

DEALERS:

SEATTLE, WASH.	Washington Machinery Co.
VANCOUVER, B. C.	Universal Equipment Co.
SALT LAKE CITY, UTAH	Lund Machinery Co.
SAN ANTONIO, TEX.	Closner Equipment Co.
LOS ANGELES, CALIF.	Garlinghouse, Fremon Co.
BERKELEY, CALIF.	West Coast Engine & Equip. Co.

Pennsylvania Crusher Division, Exclusive Licensed Eastern Manufacturer and Distributor, 323 S. Matlack St., West Chester, Penn.
Armstrong Whitworth (Metal Industries) Ltd., Authorized Licensed Manufacturer and Distributor. Close Works, Gateshead-upon-Tyne 8, England

Machinery & Equipment Company, San Francisco, Calif., has named JEROLD R. BABIN as assistant to the sales manager, Walter W. Sicke Jr.

ROBERT C. KANY has been named a representative in Florida for the line of corrosion engineering products manufactured by the Pennsalt Chemical Corporation, Philadelphia, Pa.

Joy Manufacturing Company which recently entered the minerals dressing field with a high tension iron ore separator, has been licensed to sell an allied product, the Hazemag impact crusher, developed by the Hazemag Company of West Germany.

Manufacture and sale of the Hazemag is handled by Joy's Minerals Dressing Department in the Mining and Construction Division. M. Bruce Mairs is product manager of the department.

D. Ghysels

P. E. McNall

Edgar McNall, president of the McNall Machinery and Supply Corporation, Cedar Rapids, Iowa, announces the opening of a branch with complete shop and extensive display facilities on Highway 20 East in Fort Dodge. McNall Machinery is the exclusive distributor for Sargent and Insley cranes, shovels, and draglines, Oliver tractors, Trojan (Yale & Towne) four-wheel loaders, Hercules-Galion ready-mix equipment, and several other lines of construction equipment.

DAVID GHYSELS, who has been with McNall for three years, heads the operations of the Fort Dodge branch, and will supervise the sales, service, and parts distribution in the western half of Iowa.

Also announced was the appointment of PAUL E. MCNALL as vice-president and sales manager for the McNall Machinery and Supply Corporation, with headquarters in Cedar Rapids. Mr. McNall has been with the firm for ten years.

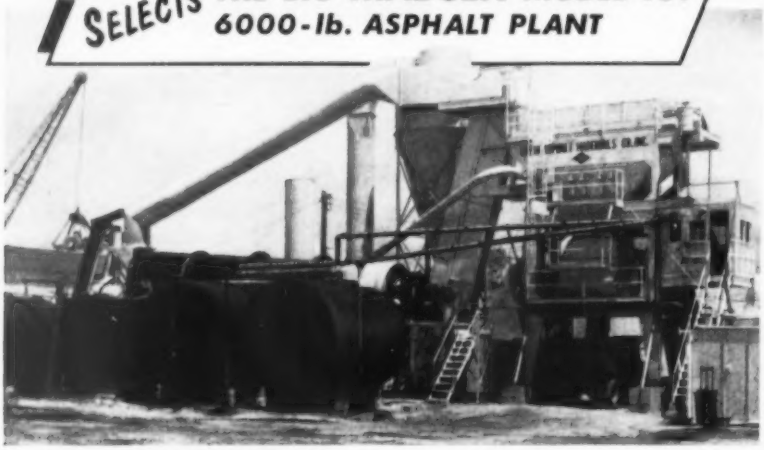
Appointment of the Fincham Equipment Company, Inc., Denver, Colo., as a distributor has been announced by the Koehring Division, Koehring Company, Milwaukee, Wis. Territory to be covered by Fincham Equipment includes the entire state of Colorado and several counties in southern Wyoming.

J. V. S. NORTON has been named assistant sales manager, Eastern Region, by the Bucyrus-Erie Company, South Milwaukee, Wis. He will work out of the New York office.

Mr. Norton has been associated with the mining industry for 32 years, including the last 13 in Bucyrus-Erie's export sales department.

UNION ASPHALT MATERIALS CO., Inc., Ostrander, Ohio

SELECTS THE BIG MADSEN MODEL 481 6000-lb. ASPHALT PLANT



...for FAST PRODUCTION

...for EASY, LOW-COST MAINTENANCE

What do you look for in an asphalt plant? Union Asphalt Materials Co., Inc., Ostrander, Ohio wanted the clean operation, oversize construction, maintenance economy, and the fast production and big tonnage output of the MADSEN Model 481. The MADSEN 6000-lb. plant shown above gives this successful contractor these MADSEN advantages...advantages that can pay-off in greater owner profits for years to come. Three of the outstanding MADSEN features which help provide these advantages are:

1. **Fast air-cylinder operation**—through conveniently located control console. Levers electrically energize solenoid-operated air valves for faster control of bin gates, weigh-box, mixing, asphalt injection, asphalt charging and dumping to truck.

2. **Oversize MADSEN Twin-Shaft Pug Mill Mixer**—for the ultimate in fast, thorough mixing. Curved bottom and center liners are externally removed and installed ... an easy 20-minute job per liner section for one man *without getting on the inside of mixer.*

3. **Triple discharge bin gates**—for livelier, more efficient bin action. Aggregates are withdrawn from each bin compartment through 3 openings. This MADSEN feature (patent pending) eliminates "coring out" and segregation—results in more uniform filling of the weigh-box.

MADSEN *Equipment that Serves*

COMPLETE PARTS STOCK AVAILABLE IN LOS ANGELES AND LIMA, OHIO

This is only part of the story why successful operators select MADSEN. *Complete details on the* MADSEN *Model 481 4000-lb., 5000-lb. and 6000-lb. Asphalt Plants are shown in Bulletin 800-A. Ask your Distributor for your copy or write direct.*

MADSEN WORKS / Construction Equipment Division BALDWIN-LIMA-HAMILTON

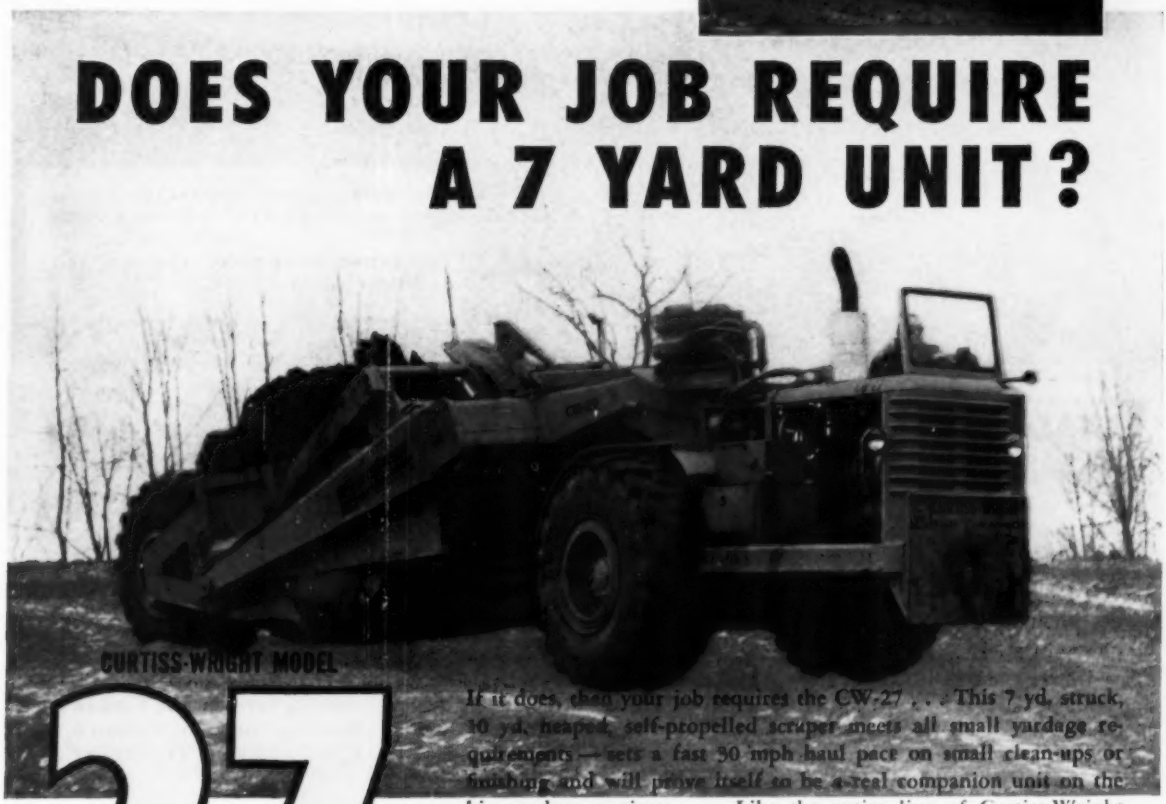
14120 E. ROSECRANS AVE., P.O. BOX 38, LA MIRADA, CALIFORNIA

BALDWIN-LIMA-HAMILTON CORPORATION, LIMA, OHIO

Enter 196 on card, page 139

...more profit with every pass

DOES YOUR JOB REQUIRE A 7 YARD UNIT?



CURTISS-WRIGHT MODEL

27

CW-27 SELF-PROPELLED SCRAPER

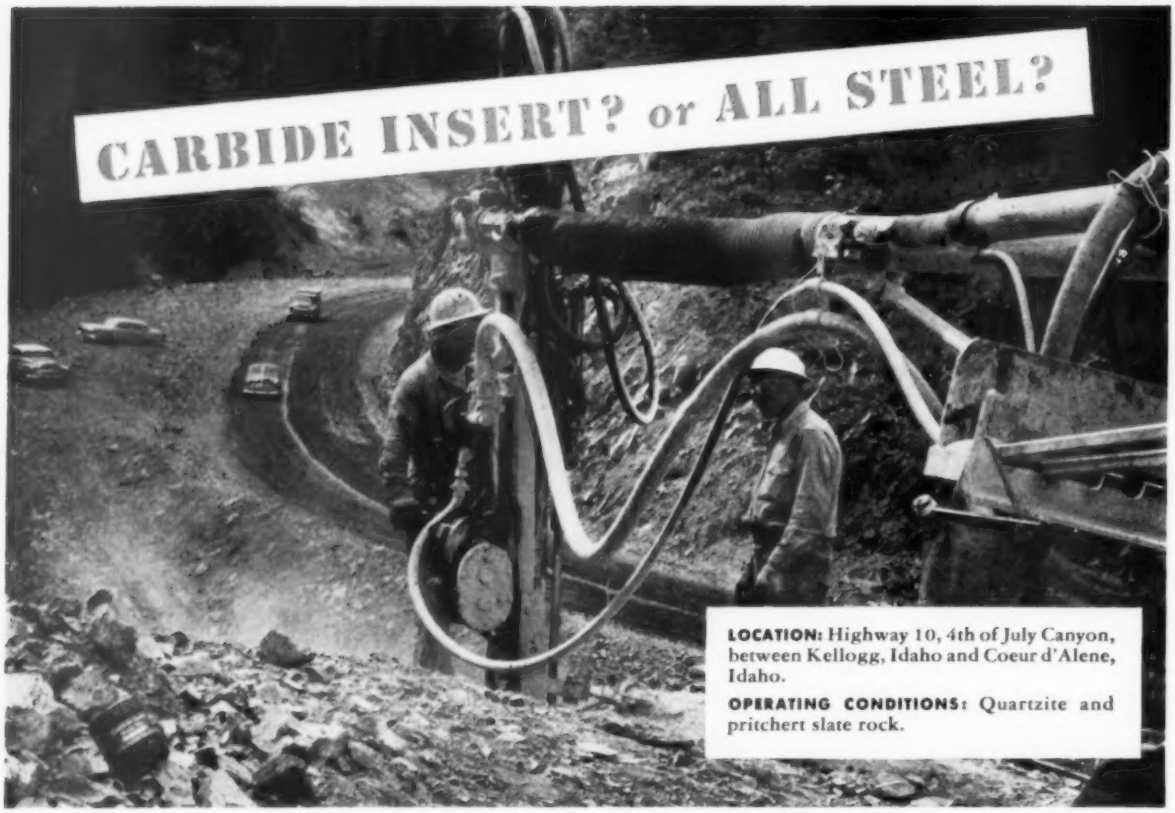
Capacities: 7 cu. yds. struck, 10 cu. yds. heaped, 26,000 pound rated load

If it does, then your job requires the CW-27 . . . This 7 yd. struck, 10 yd. heaped, self-propelled scraper meets all small yardage requirements — sets a fast 30 mph haul pace on small clean-ups or finishing and will prove itself to be a real companion unit on the big yardage projects . . . Like the entire line of Curtiss-Wright 'plus-yardage' scrapers, the CW-27 boasts such maintenance and production advantages as unit construction, Roto-Gear steer, constant live winch and positive roll-out ejection . . . To insure the utmost from every scraper, Curtiss-Wright engineers to the contractor's requirements . . . To be sure you get the most from all your jobs, check with Curtiss-Wright first!

SOUTH BEND DIV. CURTISS-WRIGHT CORPORATION, SOUTH BEND, INDIANA

SALES • SERVICE • PARTS
at your
CURTISS-WRIGHT DISTRIBUTOR

SOUTH BEND DIVISION
CURTISS-WRIGHT
CORPORATION
SOUTH BEND, INDIANA


CARBIDE INSERT? or ALL STEEL?
LOCATION: Highway 10, 4th of July Canyon, between Kellogg, Idaho and Coeur d'Alene, Idaho.
OPERATING CONDITIONS: Quartzite and pritchert slate rock.

"We get more re-grinds per bit, lower cost with TIMKEN® carbide insert bits"

. . . Reports F. H. Slate and E. C. Hall Co.

IN constructing 7.2 miles of new four-lane highway in 4th of July Canyon between Kellogg, Idaho and Coeur d'Alene, Idaho, F. H. Slate and E. C. Hall Co. must drill through quartzite and pritchert slate rock. Using Timken® carbide insert bits, they average 12 to 14 re-grinds per bit, drill 20 to 100 feet of blast hole per pass. And with proper grinding, they use all of the carbide height with no fracturing of carbides when discarded. Bit cost per foot-of-hole stays at the minimum, production at the maximum.

Timken carbide insert bits are your best bet, too, for drilling in hard, abrasive ground. But in ordinary ground, you should use Timken all steel multi-use bits. They're interchangeable in the same thread series. Without changing drill steels, bits can be changed quickly and easily as the ground changes.

All Timken rock bits are made from our own electric furnace fine alloy steel. We're the only American removable bit manufacturer that makes its own steel. And for even longer life, Timken bits have a specially developed shoulder union that protects threads against drilling impacts.

To get all these advantages and get the right bit for your job, call or write Timken Rock Bit Engineering Service, The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

Timken threaded all steel multi-use rock bit

Timken threaded carbide insert rock bit

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

your best bet for the best bit for every job

At the annual meeting in January stockholders of the Four Wheel Drive Auto Company, Clintonville, Wis., voted to change the company name to the FWD Corporation. The name change was effected to avoid the misleading connotation of the old name. FWD has not produced an auto since 1912, according to Maurice E. Ash, FWD president, and now makes many types of vehicles in addition to four wheel drive.

The Marlow Pumps Division, Bell & Gossett Company, Midland Park, N. J., has appointed E. C. STORK manager of the Longview plant, a sales and assembly unit of the Marlow Division.

Mr. Stork has been with the Marlow organization since 1954, when he joined the firm as a district sales engineer covering parts of Texas, Louisiana, Mississippi, Arkansas, and Tennessee.

E. C. Stork

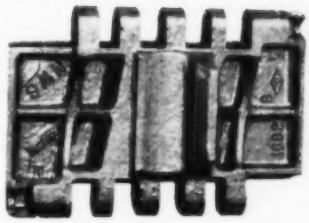
G. S. Rigdon

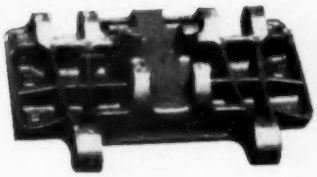
As a result of a new organizational setup, GILBERT S. RIGDON has been elected executive vice-president of the "Quick-Way" Truck Shovel Company, Denver, Colo.

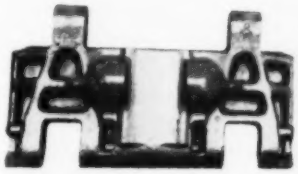
At a recent sales meeting in Chicago, Mr. Rigdon announced that "Quick-Way" will soon introduce a new model, the 150A 15-ton crane, and plans are under way to make several improvements in the present "Quick-Way" line.

The Air Reduction Sales Company, a division of the Air Reduction Company, Inc., New York, N. Y., has completed a new facility for the production of oxygen and nitrogen at 1100 Packard Street, Kansas City, Kans. The new plant replaces an Air Reduction facility at 1000 W. 26th Street, Kansas City, Mo.

Columbia MANGANESE STEEL CRAWLER SHOVEL PADS







- LONGER SERVICE LIFE
- ALL MAKES OF SHOVELS
- INTERCHANGEABLE WITH ORIGINAL PARTS

MANGANESE CRUSHER JAWS • ROLL SHELLS
GYRATORY PARTS • SHOVEL PADS • BUCKET TEETH

Columbia
COLUMBIA STEEL CASTING CO., Inc.
933 N.W. Johnson St., Portland 9, Oregon, U.S.A.

Enter 199-A on card, page 139

NO SPOT FOR A BREAKDOWN!

KEEP IT GOING AT ITS BEST ...USE ONLY GENUINE HAYWARD REPAIR PARTS!

Hayward Buckets are designed with the most efficient construction features known. And only with *genuine* Hayward replacement parts can you be sure of maintaining that same high quality. Cheaper "bootleg" parts reduce efficiency, raise operating costs and disrupt schedules.

Anticipate any possible breakdown.
Write today for list of genuine Hayward parts.

THE HAYWARD COMPANY
50 CHURCH STREET, DEP'T P, NEW YORK 7, N. Y.
Builders of Better Buckets Since 1888

Enter 199-B on card, page 139

ROBERT J. RUSSELL has been appointed executive vice-president of the Hardinge Company, York, Pa.

Mr. Russell joined the Hardinge staff in 1929 as a development engineer for pulverized fuel. This was followed by several years of field erection and service, after which he specialized in equipment design and development. In 1949 he was made technical staff chief and secretary of Hardinge, and in 1951 he became sales manager. He was elected vice-president in charge of sales in 1953, and subsequently assumed the additional duties of corporation treasurer, which position he still retains.

V. W. COPCUTT has been named marketing manager of Research-Cottrell, Inc., Bound Brook, N. J. Mr. Copcutt formerly was assistant manager, product engineering, and prior to that had worked seven years as process engineer of precontract work for the firm.

Directors of the Branford Company, New Haven, Conn., manufacturer of pneumatic vibrators, sprayers, and other specialties, have named RANDOLPH L. RUHLEY to the position of vice-president and general sales manager.

R. L. Ruhley

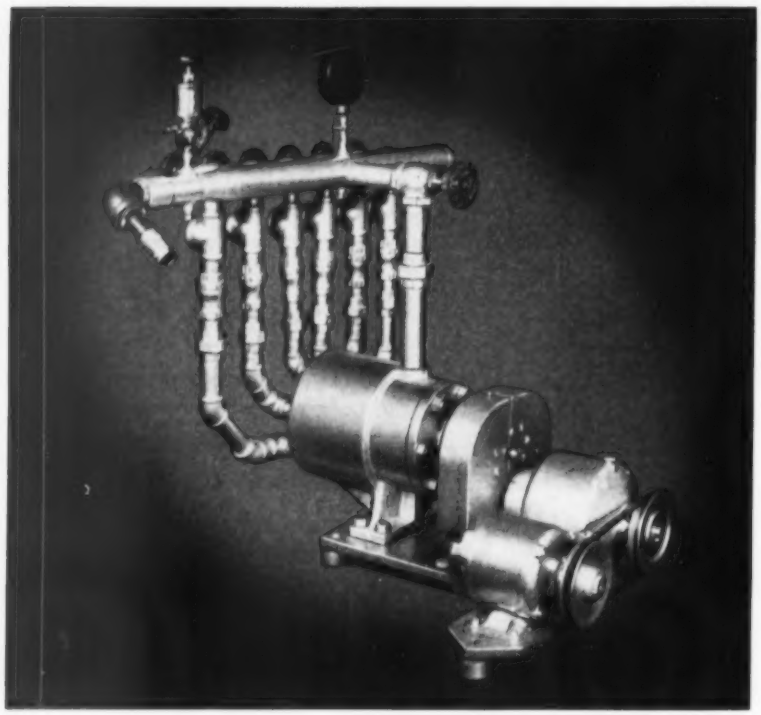
R. K. Warner

ROBERT K. WARNER has been elected vice-president—sales of the Hoyt Wire Cloth Company, Lancaster, Pa., manufacturer of aggregate wire screens. Mr. Warner has been with Hoyt since 1954. He formerly had been employed by the Gilbert and Bennett Manufacturing Company, Georgetown, Conn., and John A. Roebling's Sons Corporation, Trenton, N. J.

Yaun Manufacturing Company, Inc., Boston Rouge, La., announces its new plant in McComb Miss., for the manufacture of large clamshell buckets. The all-steel, welded construction building has 15,000 sq. ft. of floor space and is completely equipped with machine shop and a 300-ton press.

Purchase of the trailer and truck equipment business of the Truck Engineering Corporation, Cleveland, Ohio, manufacturer of trailer dump units, was announced by The Heil Company, Milwaukee, Wis. According to Heil Company officails the Truck Engineering Corporation will continue to operate as the TEC Division of The Heil Company.

Julius L. Glick, formerly president of Truck Engineering, will continue to direct the Cleveland operation as general manager of the new Heil division, and Robert L. Morse, vice-president of Truck Engineering, will remain as assistant general manager.



MANITOWOC CENTRAL CONTROL VALVE FOR SLURRY AGITATORS

The Manitowoc Central Control Valve is a self-contained, fast acting unit complete with air manifold and valve drive. Shown above is a motor-driven central control valve regulating air supply to six slurry agitators. It can be timed with great precision to suit any desired operating cycle and any electrical current characteristic. The entire unit is mounted on a common bed plate with driving mechanism fully enclosed and automatically lubricated.

The Manitowoc Slurry Agitator is designed to use air on an intermittent cycle —as supplied by the Central Control Valve—as economically as possible, and at the same time employs a unique method of piping that prevents the air line from plugging.

Get complete information on the Manitowoc Central Control Valve, Slurry Agitators and Recuperators for rotary kilns—write today!

MANITOWOC SHIPBUILDING, INC.

MANITOWOC, WISCONSIN

Enter 200 on card, page 139

Master Key...

TO POWER'S LOW COST FUTURE

BITUMINOUS COALS FOR EVERY PURPOSE

• Bituminous coal contributes to plant operating profits by its *productivity* and *stability*. Virtually limitless supply, plus most modern mining methods, gears production to *any volume demand*.

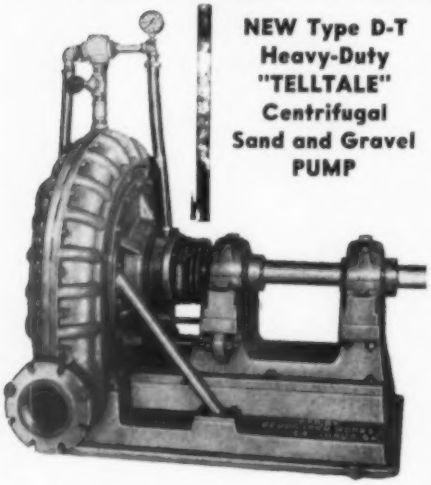
Accessibility and increasingly efficient burning equipment mean economical, constant-cost for today and tomorrow.

B&O

B&O B&O B&O B&O B&O B&O

Ask our man! BALTIMORE & OHIO RAILROAD, BALTIMORE 1, MD., Phone: LExington 9-0400

THE COST OF PRODUCTION PER YARD IS WHAT COUNTS



NEW Type D-T Heavy-Duty "TELLTALE" Centrifugal Sand and Gravel PUMP

It's the amount of material passing through a pump that wears out parts. Figure your production cost per yard per hour and you will find "Telltale" the most economical as well as the most productive of pumps.

AS LOW IN DOWNTIME AS IT IS HIGH IN PRODUCTION

"Telltale" is the only pump that warns when it's time to reline. Air sucked through periphery ports causes pump to lose its prime. Pumping stops. Water leaking through the ports signals that the shell liner and the surrounding belt of packing have worn through.

Available with either tough semi-steel or best-in-the-long-run Ni-Hard wearing parts in 4", 6", 8", 6 x 8" suction and 8 x 10" suction. Now available also in either alloy, 45 and 90° extra-heavy long-radius flanged elbows. Write for Type D-T Heavy-Duty folder and prices.

PEKOR IRON WORKS, INC.

LOCK DRAWER 909 — *ESTABLISHED 1892* FAIRFAX 2-4020 — COLUMBUS, GEORGIA

Enter 202-A on card, page 139

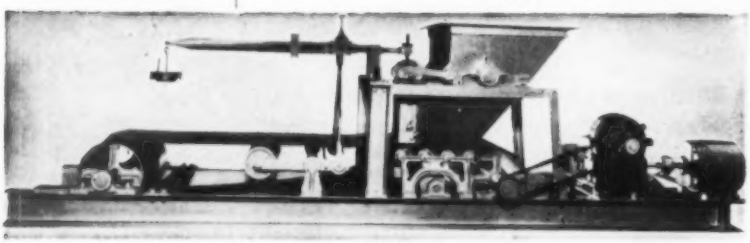
ONE SCALE performs all jobs **BETTER**

▼ WEIGHS ▼ BLENDS ▼ FEEDS

OVER 1500

SCHAFFER POIDOMETERS

now serving Industry



▼ MIXES ▼ RECORDS ▼ PROPORTIONS ▼

THIS MACHINE is a "perfect fit" for ably handling every scaling operation in bulk material processing plants.

It's fast, automatic, accurate . . . provides high product uniformity and top capacity. Poidometer design and construction assure years of trouble-free service under all working conditions.

Available with remote control devices for showing and changing feed rate, and total weight recorders.

Write for CATALOG No. 5

SCHAFFER POIDOMETER CO., 2828 SMALLMAN ST., PITTSBURGH 22, PA.

Enter 202-B on card, page 139

Control of the Reed Instrument Bearing Company, Los Angeles, Calif., has been acquired by SKF Industries, Inc., Philadelphia, Pa., according to an announcement from E. R. Broden, president and chairman of the board of SKF. Reed Instrument will operate as a division of SKF, with O. M. BERGETHON, Reed's director of operations, as general manager.

Rankin Manufacturing Company, Alhambra, Calif., has named CLARENCE A. NIELSEN to the position of district manager in charge of *Ranite* and *Ranomatic* hardsurfacing sales in the northeastern section of the United States and Canada. Mr. Nielsen will make his headquarters in Cleveland, Ohio.

C. A. Nielsen

G. A. Sabin

GEROULD A. SABIN, advertising director of the Colorado Fuel and Iron Corporation, Denver, Colo., was presented with the "Advertising Man of the Year" award at a recent meeting of the Advertising Club of Denver.

Mr. Sabin began working for Colorado Fuel and Iron in 1926 as sales promotion director, and in 1930 he became advertising manager. After CF&I and Wickwire Spencer Steel merged in 1946 he became director of advertising.

WILLIAM L. KURZ has been elected secretary of The W. W. Sly Manufacturing Company, Cleveland, Ohio. Mr. Kurz will continue in his present duties as assistant to the president.

With the firm for more than 10 years, Mr. Kurz has served in production, general sales, and industrial oven sales. Since 1954, when he was appointed assistant to the president, he has also been active in advertising, personnel management, and labor relations.

Bill Rigney, Horace C. Stoneham and Carl Hubbell

"Welcome to the newest giant in San Francisco"

says Horace C. Stoneham, President of the San Francisco Giants baseball team

Here's the "big-league" hitter in crushing equipment batting 350 tons an hour, all day long!

The largest portable crushing plant in existence, a Universal 293QS "warms up" to turn out 200,000 tons of aggregate for the San Francisco Giants' new baseball stadium to be completed in 1959.

Not visible, but "pitching" to the giant 293QS plant from the left is another Universal plant, a 'dozer-fed, 3042 primary jaw crusher.

Flanking Horace Stoneham for the "warm-up" at the new stadium site are these well-known Giants, Bill Rigney and Carl Hubbell — always interested in seeing "fast delivery", whether from men or machines.

Under Charles L. Harney, Inc., San Francisco contracting firm, the stadium project will require 150,000 tons of 1½" crusher-run base material and 50,000 tons of ¾" type-"B" plant-mix.

"Our schedule makes this a 'no-time-out' project," says Joseph P. Silvestri, vice-president of the Harney firm, "so we picked the Universal 293QS for its extraordinary capacity and its versatility on the job."

To star in a major club like the San Francisco Giants, a ball player must become an unerring performer. Speed and stamina — plus precision and plenty in reserve — are his characteristics . . . and the ability to do more than one thing, and do it well.

All these are characteristics, too, of the Universal 293QS, a "pennant-winner" among portable crushing plants for the past 20 years.

Offering the most varied line of portable plants on the market, Universal is capable of serving everybody: from 50 tons an hour to 350 or more tons an hour.

So, whether you're in the "minors" or the "majors", give us a whistle. We'll come running out of the dugout — on-the-double — to serve you.

UNIVERSAL 293QS

The equivalent of a stationary plant on wheels, this portable crusher is truly the "giant" of them all!

Three stages of reduction with only two crushers. First stage: jaw crusher. Second and third stages: Universal "TwinDual" rolls.

Exclusive Universal (30") "TwinDual" roll crushers allow up to 100% wider discharge opening of the 2036 Universal jaw. Space and weight savings are achieved by mounting the roughing and finishing rolls of the "TwinDual" unit on two shafts instead of four.

Skid-mounting of the jaw enables the plant to meet highway weight limitations for fast, easy movement.

Convert it from gravel to rock production by substituting an apron feeder for the swivel-feed conveyor and scalping screen ahead of the jaw and you've got the most versatile piece of crushing equipment you can buy.

PETTIBONE UNIVERSAL
In Cedar Rapids Since 1906

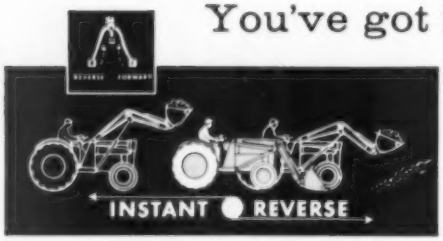
UNIVERSAL ENGINEERING CORPORATION

619 C Avenue, N.W., Cedar Rapids, Iowa

Subsidiary of Pettibone Mulliken Corporation, 4700 W. Division Street, Chicago 51, Illinois

M-F... has the only New Approach to Utility Rigs

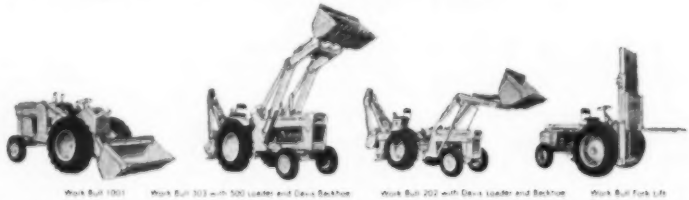
INSTANT ⟷ **REVERSING**



You've got it **Coming... or Going** on the New *WORK BULL 204* with **Torque Converter**

Massey-Ferguson again shows its leadership in the industrial field with the most important development ever made on industrial utility tractors. This all-new, field-proven Work Bull 204 changes directions instantly, but smoothly, at the touch of your toe – and has a torque converter to maintain correct power-to-load ratio. An efficient 3-point pedal control lets you select forward, reverse, or just engine acceleration. Your hands are free to control the tractor or Davis Loader attachment.

The Work Bull 204 has a high-torque, 40-hp engine with four equal speeds in either direction to provide a wide work range as well as a favorable road speed. It has full-time power steering, individual left and right brakes, and a hand throttle to pre-set engine rpm for operating attachments. The exclusive Ferguson 3-point hitch provides hydraulic draft control for rear-end attachments. Your choice of new model Davis Loaders, Backhoes, Scarifier-Scrapers, or other power-matched M-F attachments gives you the best all-around rig you could ever own. ***Write for the name of nearest dealer and see him soon.***



MASSEY-FERGUSON INDUSTRIAL DIVISION
1009 SOUTH WEST STREET • WICHITA 13N, KANSAS

THE MAN WITH THE MULTIWALL PLAN

UNION PACKAGING SPECIALIST HENRY SCOTT

simplifies packer's inventory –trims costs by $42,000

"How can we get more out of our Multiwall dollars?"

The question, put by a Southern packer to Union Packaging Specialist Henry Scott, led to a complete analysis of the company's bagging operation. The analysis in turn produced three important recommendations. And $42,000 annual savings!

Union Multiwall Recommendations are based on this 5-Star Packaging Efficiency Plan

- DESIGN
- EQUIPMENT
- CONSTRUCTION
- SPECIFICATION CONTROL
- PLANT SURVEY

Working through Union's 5-Star Packaging Efficiency Plan, Scott reduced the size of one bag. The shorter Multiwall gives firmer packing and neater stacking. Further package engineering enabled the company to reduce its range of Multiwall bag styles and sizes by 30 per cent!

Union's Art Department also created a family of high-recognition designs for the firm's existing products. And finally, a brand new design which will help launch 400,000 tons of new product to be marketed this year.

Perhaps Union's 5-Star Plan can help unearth a money-saving idea for you. Perhaps several. Worth looking into, wouldn't you say?

Better Multiwall performance through better planning

union camp

UNION'S PACKAGE ENGINEERING DEPARTMENT will study your Multiwall bagging methods and equipment and make appropriate recommendations, regardless of the brand of Multiwalls you are now using.

UNION MULTIWALL BAGS

UNION BAG-CAMP PAPER CORPORATION

233 BROADWAY, NEW YORK 7, N. Y.

Follow the light lines. They show the "long reach" moves an operator makes with conventional controls to complete a hoe cycle, then shift from swing to travel, steer right and left and shift back from travel to swing. Such "arm's-length" work with slow mechanical or booster systems adds seconds to every move, drains operator strength, cuts end-of-the-shift output.

Time-light camera shows!

Which shovel-crane

Speed-o-Matic Power hydraulic controls increase output by decreasing cycle time and reducing operator fatigue

Speed-o-Matic controls bring pinpoint accuracy to dragline, shovel, clam, crane and hoe operations. Design eliminates over 150 mechanical parts from linkage alone. Hydraulically actuated clutches adjust automatically for heat and normal lining wear.

No reaching, no yanking . . . just easy, "keyboard" operation with Speed-o-Matic controls and Independent-Swing-and-Travel when performing the same operations as the hoe with conventional controls. Short-throw levers speed cycles, up output, conserve operator strength. Ask the man who has worked both controls. He'll pick Speed-o-Matic every time!

is producing more?

Pushing a shovel-crane at its highest limit all shift long is easy with Speed-o-Matic power hydraulic controls.

That's because fingertip controls keep the operator fresh where long-throw levers multiply fatigue. And Speed-o-Matic—standard on all Link-Belt Speeder shovel-cranes—is the original fingertip, flick-of-the-wrist system.

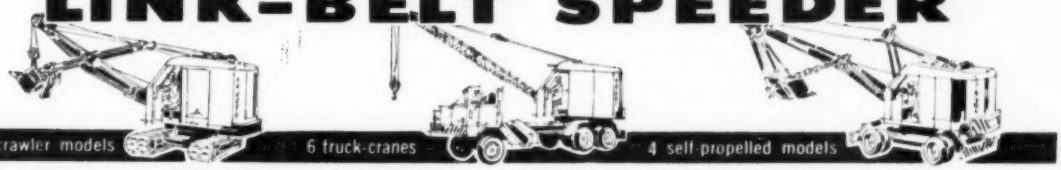
Hydraulic pressure assures the same fast, smooth response *all day*, without adjustments . . . and with perfect feel of the load at every lever position.

And Speed-o-Matic power-hydraulic controls are only one of many Link-Belt Speeder advantages. Others include—

- GREATER USABLE HORSEPOWER
- FULL-FUNCTION DESIGN tailors the machine to the job . . . permits more standard and optional features such as Independent-Swing-and-Travel.
- BONUS CRANE CAPACITY when using long booms at extended radii.

For complete details on why your best shovel-crane investment is a Link-Belt Speeder, contact your distributor or write LINK-BELT SPEEDER CORP., Dept. PQ-458, Cedar Rapids, Iowa, for book 2553. 14,705

LINK-BELT SPEEDER



It's time to compare . . . with a Link-Belt Speeder

ROTARY KILNS
F. L. SMIDTH & CO.
Engineers and Machinery Manufacturers
11 West 42nd Street • New York, N.Y.
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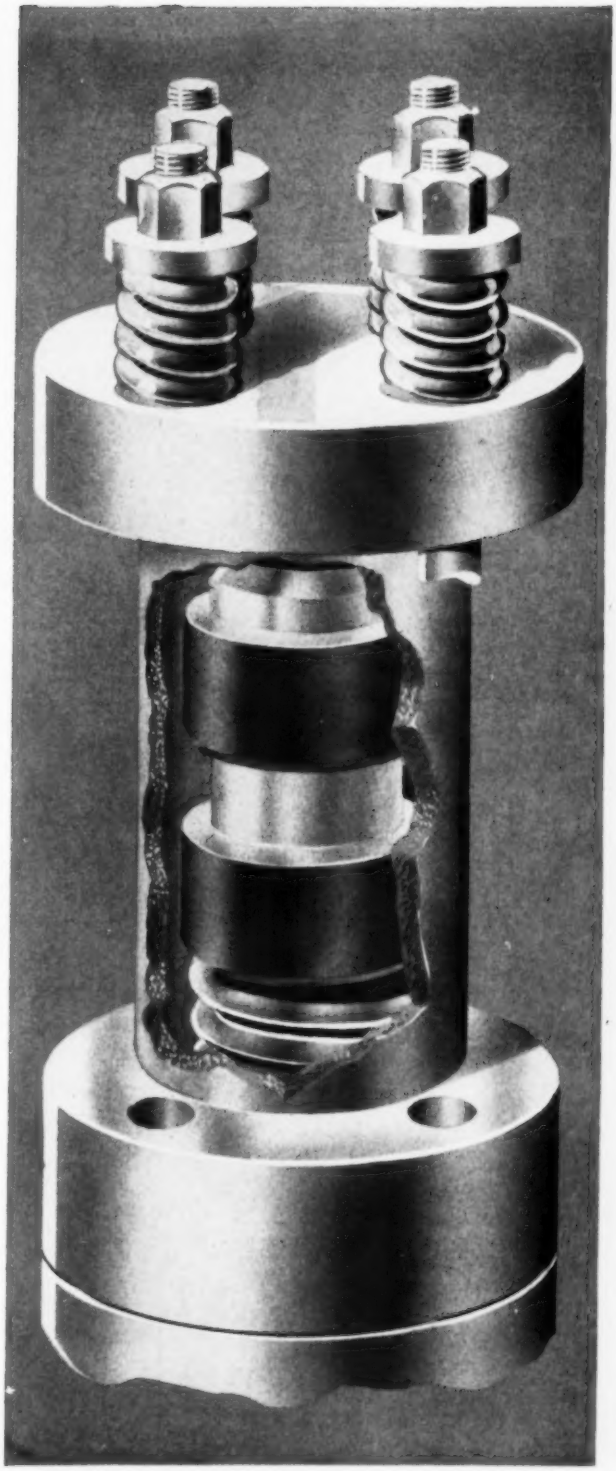
105, Piccadilly,
London, W. 1, England
F. L. Smidth & Cie France
80 Rue Taitbout
Paris (9e) France
F. L. Smidth & Co. (Bombay) Private Ltd.
42 Queen's Road
Bombay, India
F. L. Smidth & Co. of Canada, Ltd.
11 West 42nd Street
New York 36, N. Y.
F.L.SMIDTH & CO.
NEW YORK, N.Y.
F.L.SMIDTH & CO.

NOW KOPPERS LEADS AGAIN

by bringing you lower precipitator maintenance and operating costs with

K-30*

bonded pistons on pneumatic vibrators



By eliminating the need for lubrication of the rapping mechanism in electrostatic precipitators, Koppers saves you many operational man-hours and maintenance costs.

This lubrication-free operation results from bonding a new wear-resistant material to vibrator piston surfaces. This special self-lubricating compound, identified by Koppers as "K-30," is composed of Teflon† and other wear-resistant materials that together provide a self-lubricated surface.

Most rapping mechanisms demand regular maintenance to be trouble-free, but "K-30" eliminates this need and provides more reliable operation.

Koppers research, backed by many years of experience in the electrostatic precipitation field will help you find the answer to your gas cleaning problems. Check with Koppers to learn how "K-30" can develop top efficiency in present or planned precipitator installations. For more information, write: KOPPERS COMPANY, INC., 6703 Scott Street, Baltimore 3, Maryland.

*Koppers Trademark

†E. I. duPont de Nemours & Company, Inc. trademark for tetrafluoroethylene resin

KOPPERS

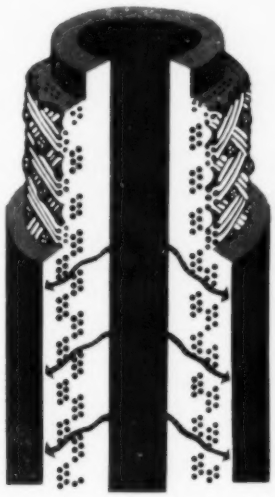
ELECTROSTATIC PRECIPITATORS

Engineered Products Sold with *Service*

R/M HOMOFLEX HOSE LASTS LONGEST on the toughest jobs

Homoflex Air Hose is the easiest handling hose made for use with air drills. Light, rugged and "flexible as a rope", it's engineered to take the beating of rough jobs . . . and last longer than any other hose. Homoflex Air Hose is mandrel-made with *no* pre-set twist. It coils and uncoils freely in any direction *without* kinking . . . without causing internal strain that can lead to hose rupture and hose failure! The exclusive Homoflex construction provides a homogeneous, inseparable tube-to-cover bond that further increases hose life. Uniform inside and outside diameters assure faster, easier, *safer* coupling . . . faster, fuller flow.

Homoflex Air Hose is also available for extra heavy duty and with yellow cover stripe for visibility; also in types for water, other fluids, and gases. Homoflex features result in lower costs for a wide range of job requirements. Let an R/M representative show you how you can get longer, trouble-free service—"More Use per Dollar"—with Homoflex Hose and other types of R/M hose.



ONLY R/M OFFERS

HOMOFLEX

CONSTRUCTION

More flexible and lighter than any other hose for equal pressure.

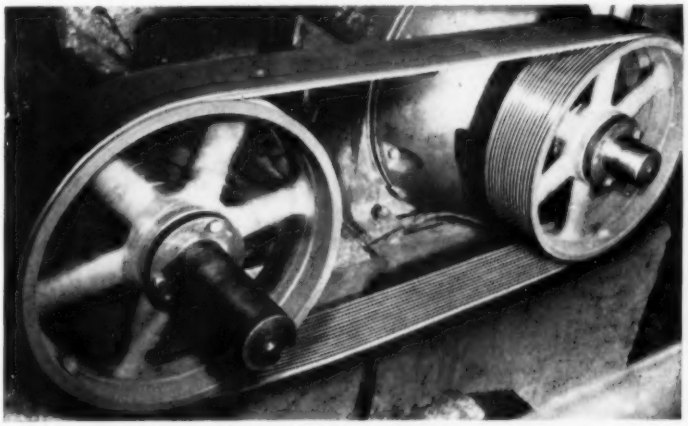
- SUPER-STRONG
- PRECISION BUILT
- FLEXIBLE AS A ROPE
- LIGHT WEIGHT

Note in cross section how specially designed braid permits the rubber tie-gum to penetrate and bond the braided plies during the plastic stage of vulcanization. This results in an inseparable tube-to-cover bond. Write for Bulletins M694 and M610.

"More Use per Dollar"

RAY-MAN CONVEYOR BELT TRAINS BETTER

Ray-Man has the extra flexibility to train naturally, trough easily . . . handle heavier loads. Cushioned strength members *plus* double compensation to relieve outer-ply stress—top *and* bottom—absorb load impact and greatly prolong belt life. Ray-Man really *holds* fasteners, is highly rip resistant . . . requires no breaker strip! Exclusive "XDC" Cover protects against wear, tear, cuts and abrasion. Check advantages of Ray-Man for your job . . . Other types include extra-cushioned Homocord for severe shock loading, and R/M Tension-Master for long lifts, high tensions. Write for Bulletin M302.



R/M POLY-V® DRIVE ELIMINATES BELT MATCHING

Single unit belt (*not* an assembly of V-belts), across full width of the drive-sheave eliminates belt "length-matching" problems. Equipment downtime and belt replacement costs are minimized. Patented Poly-V Drive has *twice* the tractive surface of a V-drive, and delivers up to 50% *more* power in the same space or *equal* power in as little as ⅔ *the space!* Just *two* cross sections of Poly-V Belt meet *every* heavy duty power transmission requirement. Greater power delivery and drive dependability begin when you specify R/M Poly-V* Drive for your mine fans and other equipment. Write for Bulletin M141.

*Poly-V is a registered Raybestos-Manhattan trademark.

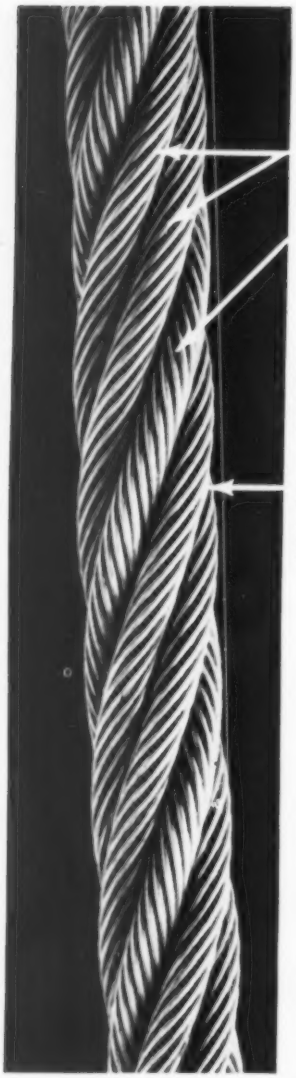
RM814

BELTS • HOSE • ROLL COVERINGS • TANK LININGS • INDUSTRIAL RUBBER SPECIALTIES

MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

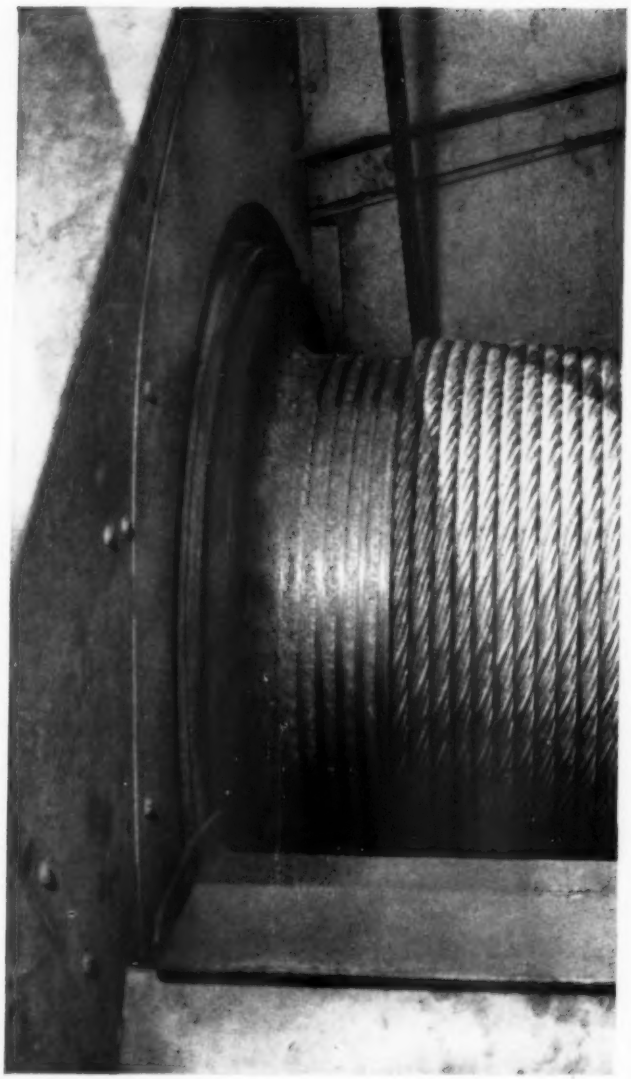
Other R/M products: Abrasive and Diamond Wheels • Brake Blocks and Linings • Clutch Facings • Asbestos Textiles • Mechanical Packings • Engineered Plastics • Sintered Metal Products • Industrial Adhesives • Laundry Pads and Covers • Bowling Balls



Herringbone's two pairs of Lang lay strands and one pair of regular lay strands provide the ideal combination of maximum flexibility with good stability.

Finer wires inside contribute to Herringbone's excellent drum-winding characteristic.

Heavier outside wires in each strand have greater resistance to abrasion.



"... we would never hesitate to recommend it"

GRAY & FEAR, CONTRACTORS

This company continues: "We have been using your Roebling Herringbone* for about one year. We find it is one of the best ropes we have ever used, outlasting previous ropes three to one. It is good that such a reliable rope is available."

This is a direct field quote on the most remarkable development in wire rope in years . . . a new concept in wire rope design. Roebling Herringbone is the regular lay and Lang lay wire rope —two-ropes-in-one rope—combining the best features of both.

Herringbone delivers extra flexibility, extra abrasion resistance, unusual structural stability, extra resistance to shock, easy operation over sheaves and drums and smooth spooling properties.

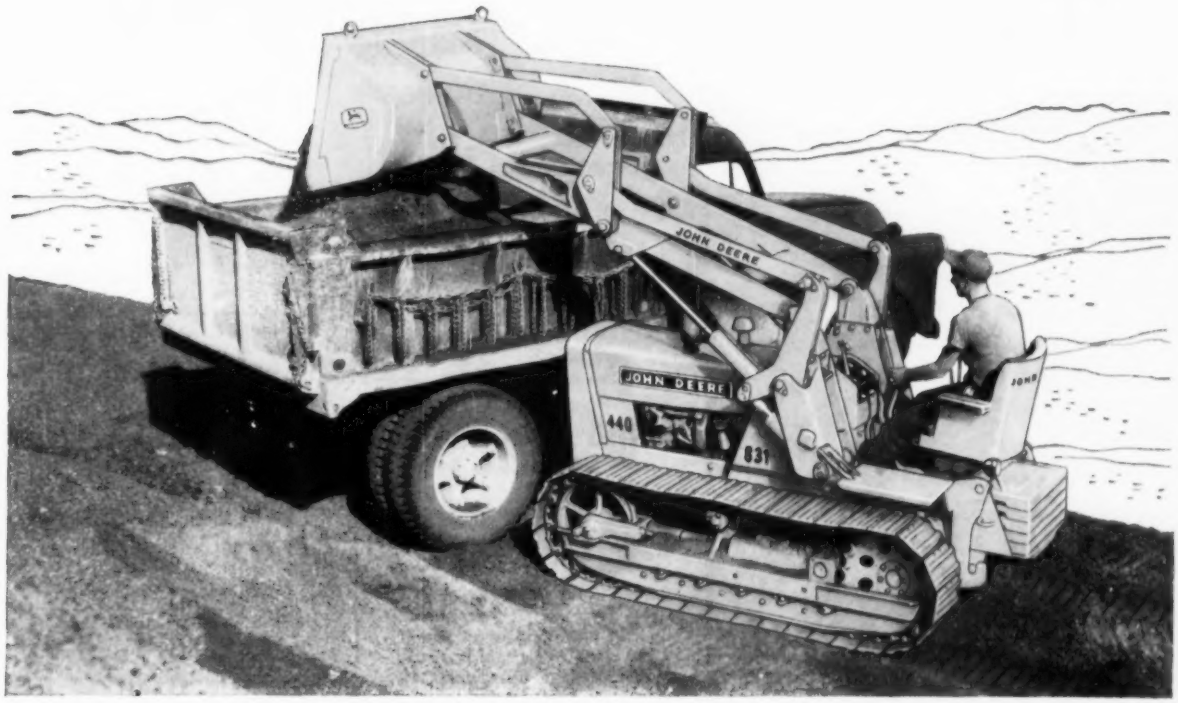
We recommend Herringbone without reservation for general hoisting and the entire range of heavy-duty equipment. Your Roebling Distributor or Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey, will give the full and fabulous details. *Reg. App. For

ROEBLING

Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation

ROEBLING
HERRINGBONE
WIRE ROPE

New REFLEX BUCKET ACTION *Plus* Direction Reverser Means More Tons Per Hour



The JOHN DEERE CRAWLER-LOADER

Fast cycle time is built right into the bucket linkage on this crawler-loader! When bucket is dumped from the full-height position, it returns to the ideal 9-degree digging angle *by use of the boom control only*. Leveling out a spot? Again, use of the boom control is all that's required to raise and dump the bucket!

Operating speed takes another jump with the John Deere clutch-type direction reverser. One throw of a convenient hand lever and you've changed direction—no need to shift gears to go into reverse or forward.

There's a 35-degree roll-back for plenty of pry-out action, and the self-leveling linkage means you get those heaped loads into the truck. Maximum dumping height is 10 feet. Bucket capacity, heaped, is 7/8 yard.

Diesel or Gasoline

This new, cost-cutting unit is now available with either gasoline or Diesel power—can be purchased on terms through the John Deere Credit Plan. See your John Deere dealer for detailed information and a demonstration on your job.

JOHN DEERE Industrial Tractors and Equipment

SEND FOR FREE LITERATURE

JOHN DEERE INDUSTRIAL DIVISION
MOLINE, ILL. • DEPT. D58H

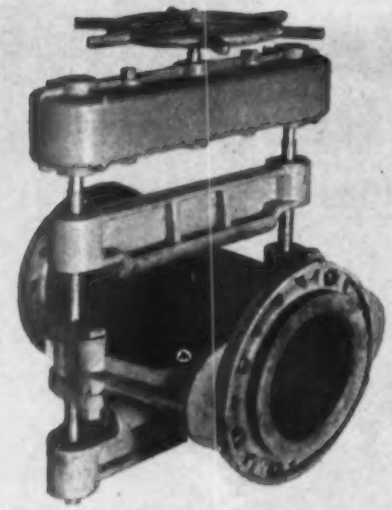
Please send literature on the John Deere "831" Crawler-Loader and the John Deere Credit Plan.

*Name*_____

*Firm*_____

*Address*_____

*City*_____ *State*_____



ECONOMIZE

with built-in REOPCO*

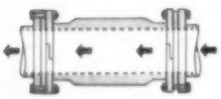
Massco-Grigsby Pinch Valves

...their Long Wearing Life makes them

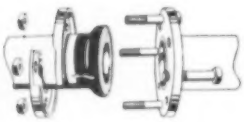
Cost Less to Own!

- **Rubber or Neoprene sleeves for abrasive and corrosive pulps and liquids**
- **1" to 14" inside diameter**
- **Pressures to 150 psi.**
- **Temperatures to 200° F.**
- **Manual or power-operated closing mechanisms**
- **Automatic regulation and remote control available.**

Patented "hinged" sleeve. Recesses serve as "hinges" during compression; reduce strain and permit tight closing.



Unobstructed flow eliminates high friction loss.



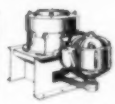
Split flanges and Flex Seal ends assure perfect seal.

*Reduced operating costs.

and Laboratory Equipment, too

4" x 6" Massco Laboratory Jaw Crusher

Welded steel frame; manganese steel jaw and cheek plates; bronze bushed bearings; smooth jaws give better product and easier cleaning. Adjust for plate wear and product size by convenient hand wheel adjustment.

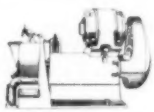


6" and 10" Massco Gy-Roll Reduction Laboratory Crusher

Reduces ½" feed to as fine as 10 mesh in single pass. High capacity, low power consumption.

Laboratory Crushing Rolls

Sizes (Diameter x width): 8" x 4", 10" x 6", 10" x 8", 12" x 10" and 12" x 12". Adjustable roll space setting up to ¾". Double V-belt drive. Heavy, cast Meehanite frame absorbs vibration, results in long life.



Massco-McCool Pulverizers

Disc type grinder with a planetary movement. No gears. Will grind to 150 mesh in one pass.

WRITE FOR CATALOGS

Manufacturing Division

THE MINE AND SMELTER SUPPLY CO.

DENVER 16	NEW YORK 17	SALT LAKE CITY 1	EL PASO
3800 RACE STREET	122 E. 42nd STREET	121 W. 2nd S.	P. O. BOX 1162

LICENSED MANUFACTURERS AND SALES AGENTS in Canada, Australia, Sweden, England, South Africa

SALES AGENTS in Peru, Chile, Philippine Islands, Japan, New York City (for Continental Europe) and in principal cities of the U.S.

NOW A LORAIN LOADER

ONE-FOOT TRAVEL CONTROL for forward and reverse—plus acceleration—boosts daily output. Operator's hands are free for other operations.

SEE THE NEW
LORAIN MOTO-LOADER ML-157 YOU HELPED DESIGN

Here's the new 2-yd Lorain Moto-Loader. It's loaded with features voted most important by users to speed operations, build profits.

It's your kind of front-end loader with the speed, maneuverability and controls that pay off best for you.

Here are some of the features you'll find:

- **a dumping height** that lets you load higher trucks and hoppers
- **a forward reach** that lets you dump farther out, load faster
- **a bucket tilt-back** that gets and keeps a full payload every time
- **a capacity and balanced weight distribution** that lets you carry 7,000 pounds without bounce or rocking
- **a one-foot travel direction and speed control** that completely frees operator's hands for other operations

plus a winning combination of other design features that you would expect on this 2-yard loader built by Lorain. Four wheel drive. Low center of gravity. Planetary wheel drive. Power booster steering. Power shift transmission. Torque converter. Four wheel hydraulic brakes.

See this Lorain Moto-Loader go through its paces. Your Lorain Moto-Loader distributor will set up a demonstration. Contact him for details.

LORAIN®

THE THEW SHOVEL COMPANY, LORAIN, OHIO

HENDRIX
DRAGLINE BUCKETS

set new standards of...

Performance

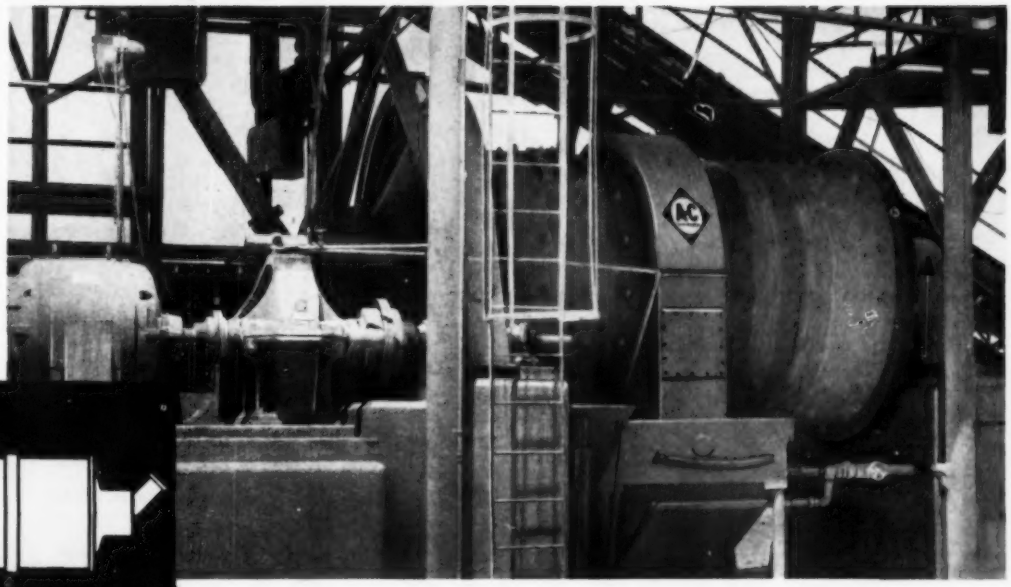
- TOPS IN PRODUCTION PROFITS
- LOW IN MAINTENANCE AND SERVICE COSTS
- A BIGGER RETURN ON YOUR EQUIPMENT INVESTMENT

"A Type for Every Digging Purpose"...
¼ to 40 Cubic Yards-Perforated or Solid

HENDRIX MANUFACTURING COMPANY, Inc.
MANSFIELD, LOUISIANA

Hendrix Lightweight DRAGLINE BUCKETS

Plan to stay ahead... MODERNIZE!



Specification Sand

from rock, aggregate or natural sand with an

ALLIS-CHALMERS ROD MILL

Here's the economical way to get specification sand, *where and when you want it*. An Allis-Chalmers rod mill will process rock, coarse aggregate or unusable natural sand into specification sand of ideal cubical texture. This equipment will extend the life of natural deposits and eliminate the expense of long-haul shipments.

Specification Reliability and Flexibility

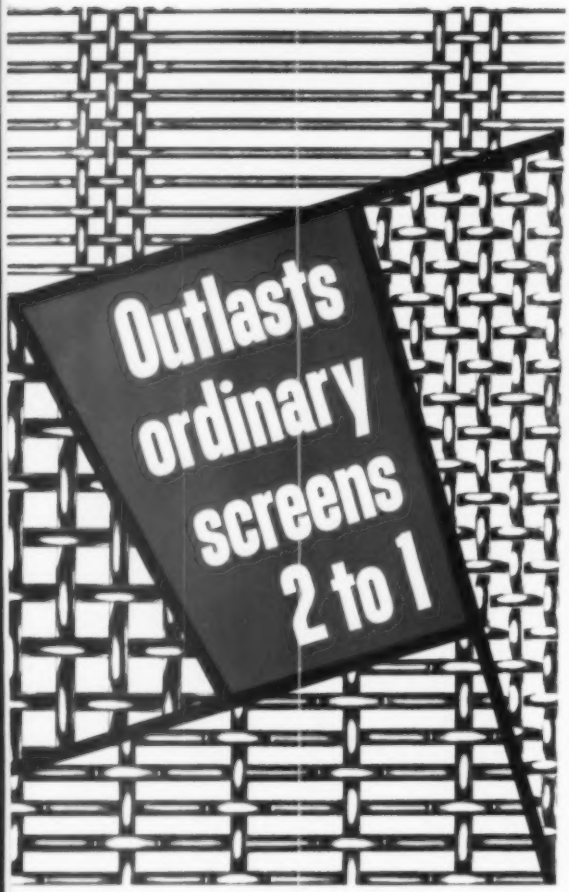
The Allis-Chalmers rod mill holds its adjustment to specification with very little attention. Changing specifications is merely a matter of changing feed, feed-water rate, or rod charge.

"Manufacturing" sand is a particularly tough, abrasive operation, but the Allis-Chalmers rod mill is built to withstand this rugged service. It's been proved the most economical machine for grinding sand — in terms of long life and low operating costs.

Contact your A-C man for details, or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wis., for Bulletin 07B6718A.

A-C ALLIS-CHALMERS

A-5847



STARSTEEL
HEAVY DUTY SPACE SCREENS

More than double the service life is reported for STARSTEEL screens in many cases. The special high carbon alloy wire used in these rugged, rigid screens is amazingly wear-resistant and tough.

Precision weaving is another reason STARSTEEL screens last so long. Openings stay accurate—the absolutely square hook strips fit machines better, install easier, insure uniformly tighter tension that resists buckling, distortion, breaking. Get double value from every screen dollar—buy STARSTEEL!

Most weaves and sizes ready to ship. **Ask for catalog.**

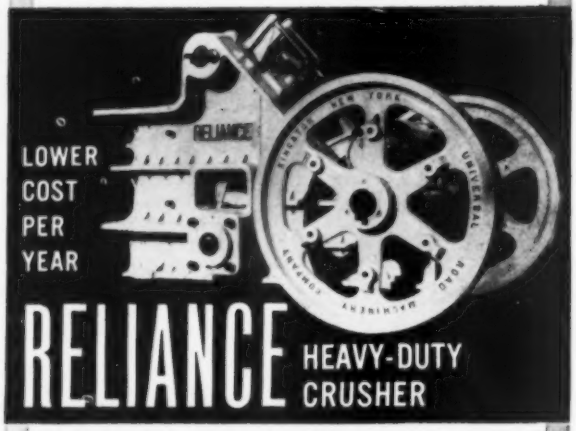
Star will produce screens or cloth from stainless or other steel alloys, Monel, brass, bronze, copper, aluminum or any metal that can be drawn into wire. Inquiries invited.

STAR
WIRE SCREEN & IRON WORKS, INC.
2515 San Fernando Road • Los Angeles 65, Calif

Subsidiary of Ludlow-Saylor Wire Cloth Company, St. Louis, Mo.

Enter 218-A on card, page 139

LEVER-TYPE JAW CRUSHER STILL IN USE AFTER 36 YEARS
—at Keystone, So. Dakota



LOWER COST PER YEAR

RELIANCE HEAVY-DUTY CRUSHER

- Heavier, stable—you save money on upkeep.
- Minimum abrasion — outlasts other designs 3 to 1.
- Long jaw plates — adjustable for fineness.
- Crushing, screening and washing plants—50 to 1,500 tons-per-day capacity —engineered to your needs.

Booklet on request, pictures installations.

UNIVERSAL ROAD MACHINERY CO.
Main office and factory: Kingston, N. Y.
New York City office: 117 Liberty St.

Enter 218-B on card, page 139

A BOON TO TRUCK CRANE OWNERS

INCREASE YOUR MOVING CAPACITY in both Short and Long Stick operations UP TO 50% with

ROLLING OUTRIGGERS
TRADE MARK PATENT PENDING

that FIT
ALL MAKES AND MODELS OF TRUCK CRANES

- ALLOW NEAR-CAPACITY LOADS TO BE MOVED OVER LEVEL AND RUGGED TERRAIN
- ELIMINATE COSTLY, TIME-CONSUMING PRACTICE OF SETTING AND RE-SETTING OUTRIGGERS AND PADS
- ALLOW GREATER LOAD DISTRIBUTION AND PREVENT OVER-STRESSING CRANE CARRIER
- TANDEM, PIVOTAL ACTION WHEEL ASSEMBLY
- RUGGED CONSTRUCTION
- INSTALLED IN FIVE QUICK MINUTES

One Pair Single Tandem Units—$850.00
One Pair Double Tandem Units—$1400.00

PRICES F.O.B. LAS VEGAS, NEVADA

"ROLLING OUTRIGGERS" INSURE MOBILITY, SAFETY AND INCREASED PROFITS

Manufactured by Lincoln Welding Works, Inc., 1320 So. "A" St., Las Vegas, Nevada

WRITE FOR NAME OF "ROLLING OUTRIGGERS" DEALER IN YOUR AREA

SOME EXCELLENT DEALERSHIPS ARE STILL AVAILABLE

Enter 218-C on card, page 139

2 to 3 times
Greater Thrust Capacity

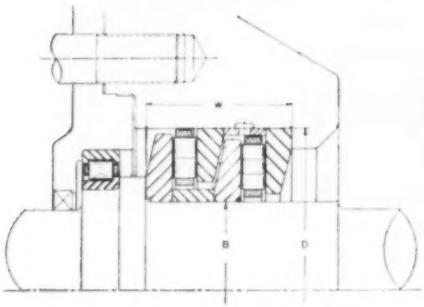
8 to 12 times
Longer Life Expectancy

New ROLLWAY
TANDEM THRUST BEARING

Using axial space along the shaft, rather than enlarging the housing diameter, this new Rollway tandem thrust bearing distributes the load over two or three stages of roller components. Gives 2 to 3 times more thrust capacity than conventional thrust bearings. Life expectancy is 8 to 12 times longer depending upon the number of stages.

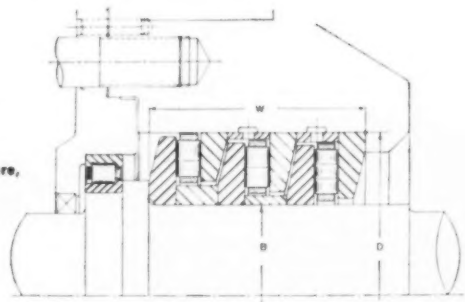
Each stage comprises a rotatable bearing plate . . . a bronze retainer with thru-hardened steel rollers . . . a compression sleeve . . . and a stationary bearing plate. The thrust load is applied to the first stage and is by-passed by each compression sleeve in turn to the remaining stage or stages.

Calculated deformation of the bearing plates distributes the load uniformly on all rollers. A greater number of rollers in the first stage carries about 60% of the load, without increasing the load per roller. Compression sleeves have cross-sectional areas proportional to the load imposed. Roller variance is held within one ten-thousandth inch.



✓ **TWO STAGE TANDEM**

22 sizes, up to 17" bore, 34" O.D., and 2,325,000 lb. capacity at 100 rpm



✓ **THREE STAGE TANDEM**

5 sizes, up to 17" bore, 34" O.D., and 3,410,000 lb. capacity at 100 rpm

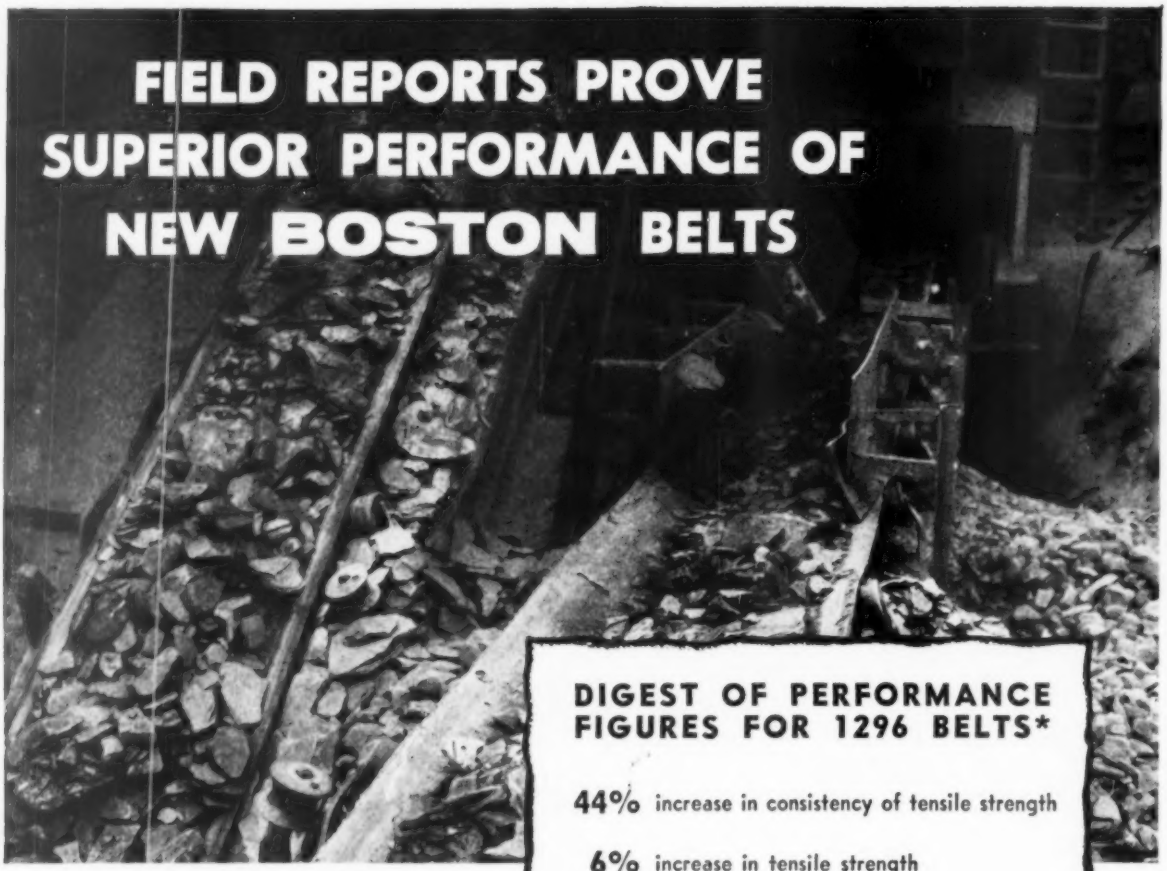
Complete Specifications on Rollway Tandem Thrust Bearings, as well as other up-to-date information on bearing design is yours for the asking. See your Rollway engineer, or write: Rollway Bearing Company, Inc., Syracuse, N. Y.

Tandem Thrust Bearing manufactured by Rollway Bearing Company, Inc. under U.S. Patent Number 2,374,820.

ROLLWAY®
BEARINGS
COMPLETE LINE OF RADIAL AND THRUST CYLINDRICAL ROLLER BEARINGS

ENGINEERING OFFICES: Syracuse • Chicago • Toronto • Cleveland • Seattle • San Francisco • Boston • Detroit • Pittsburgh • Houston • Philadelphia • Los Angeles

FIELD REPORTS PROVE SUPERIOR PERFORMANCE OF NEW BOSTON BELTS



DIGEST OF PERFORMANCE FIGURES FOR 1296 BELTS*

44% increase in consistency of tensile strength

6% increase in tensile strength

130% improvement in consistency of elongation

* Compared to belts previously manufactured

HERE'S WHAT DOES IT!

The startling figures above are a direct result of two major belt manufacturing advancements — both developed by, and exclusive with, Boston Woven Hose & Rubber Co.

ADVANCEMENT #1 **BALANCED BELT CONSTRUCTION** for the first time equalizes ply stress so that each ply pulls its full share of the load. **BBC** eliminates lazy plies. A BOSTON exclusive because only BOSTON can combine Electronic Tension Controls with Rotocure, the continuous method of vulcanization, which assures uniformity throughout the belt.

ADVANCEMENT #2 **DULON** markedly improves the aging characteristics of BOSTON belts. An exclusive BOSTON research development, the tough specially treated cover compound stays resilient longer . . . makes the belt much more resistant to abrasion, gouging, tearing and oxidation.

BALANCED BELT CONSTRUCTION plus **DULON** add up to longer belt life . . . less trouble in service . . . greater economy.

BOSTON

BOSTON WOVEN HOSE & RUBBER COMPANY
DIV. OF AMERICAN BILTRITE RUBBER CO., INC.
BOSTON 3, MASS.

RAYMOND ROLLER MILLS

Engineered for...

AUTOMATIC, UNIFORM FINE GRINDING WITH WHIZZER SEPARATION

DOUBLE WHIZZER AIR SEPARATOR

Simplified form of fineness control. Wide range of classification with one external adjustment while in operation.

Throughout the non-metallics industry, Raymond Roller Mills are setting records of performance that pay off in extra profits of production.

That is why they dominate the field in pulverizing gypsum, limestone, bentonite, kaolin, barytes, clays, phosphate rock, magnesite, bauxite and a long list of special materials.

Some of the key features of Raymond Mills that enable you to get better results are:—

Whizzer air separation to give uniform classification with maximum recovery of the fines, and to provide instant fineness control from 60% minus 100 mesh to 99.9% or better passing 325 mesh material.

Pneumatic feed control to maintain the mill operating at peak capacity under all conditions.

Self-lubricating oil journals and automatic oil circulating system insure economy in maintenance and lubrication.

Drying accessories may be used with the Mill to remove moisture while pulverizing . . . a cost saving operation.

In this new age of industry, use modern Raymond Roller Mills to get the benefits of lowest production costs.

Full line of Raymond Roller Mills covered in detail by Catalog No. 79. Write today for your copy.

COMBUSTION ENGINEERING, INC.

1122 W. Blackhawk Street
CHICAGO 22, ILLINOIS

Raymond Division

SALES OFFICES IN PRINCIPAL CITIES

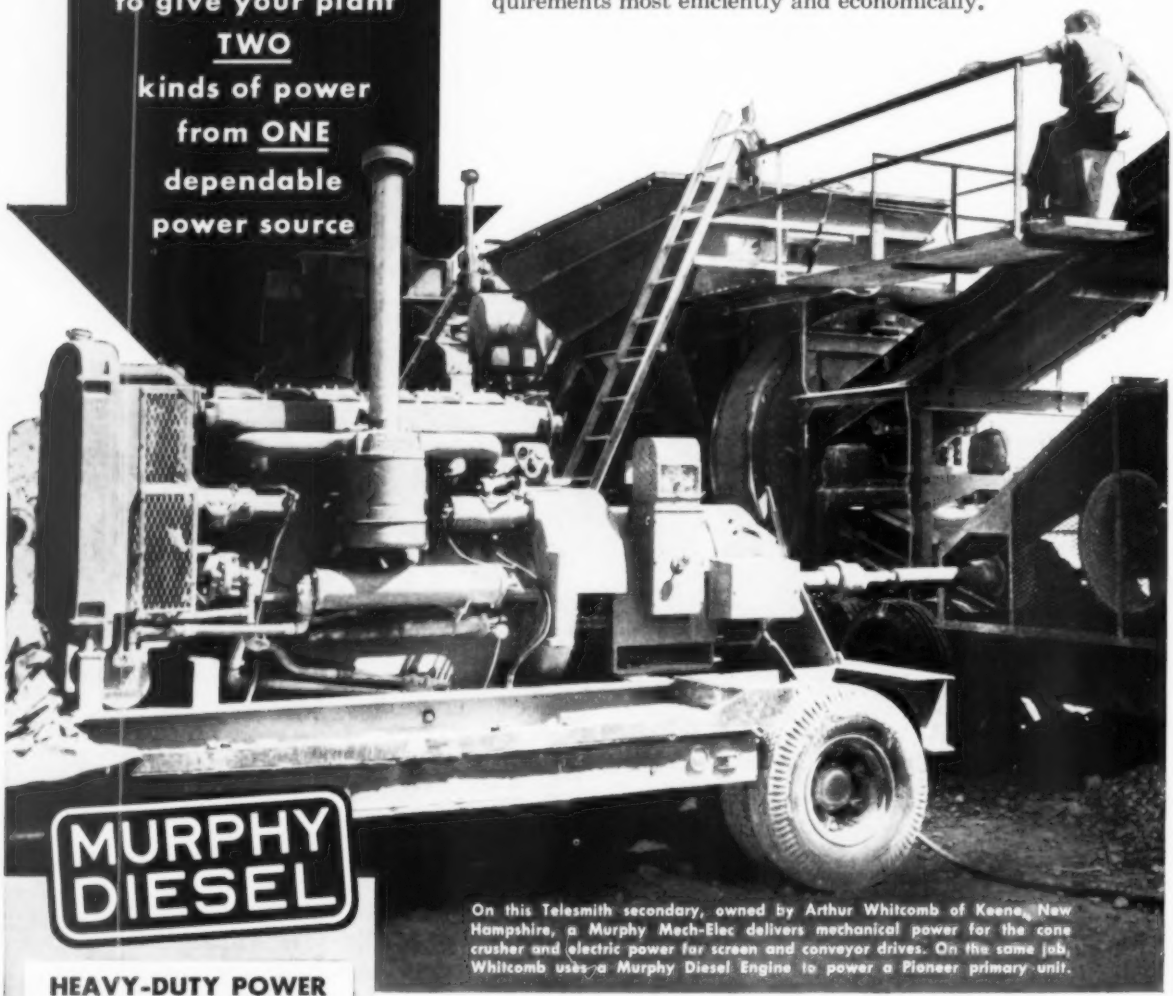
Combustion Engineering-Superheater Ltd., Montreal, Canada

MURPHY DIESEL MECH-ELEC

The simple profitable way to give your plant TWO kinds of power from ONE dependable power source

One of the most efficient and cost-cutting methods of turning pit or quarry run material into specification aggregate is to use a Murphy Diesel MECH-ELEC—the simple, compact, all-in-one power package that delivers a *combination* of heavy-duty mechanical power and low-cost electric power, separately or simultaneously!

Murphy MECH-ELEC units include all the features . . . "true" diesel operation, unit fuel injection, hydraulic servo-type governor, etc. . . . that have established Murphy Diesel's outstanding record of dependability and economy. From three MECH-ELEC sizes and generator arrangements your Murphy Diesel Dealer can help you select the unit to meet your requirements most efficiently and economically.



On this Telesmith secondary, owned by Arthur Whitcomb of Keene, New Hampshire, a Murphy Mech-Elec delivers mechanical power for the cone crusher and electric power for screen and conveyor drives. On the same job, Whitcomb uses a Murphy Diesel Engine to power a Pioneer primary unit.

MURPHY DIESEL

HEAVY-DUTY POWER for ROCK CRUSHING

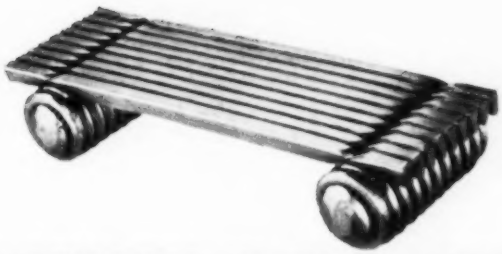
Murphy Diesel engines and power units are available in sizes from 96 to 264 H.P. with engine speeds of 1200 and 1400 rpm. "Packaged" generating units are available with capacities ranging from 64 to 165 K.W.

MURPHY DIESEL COMPANY

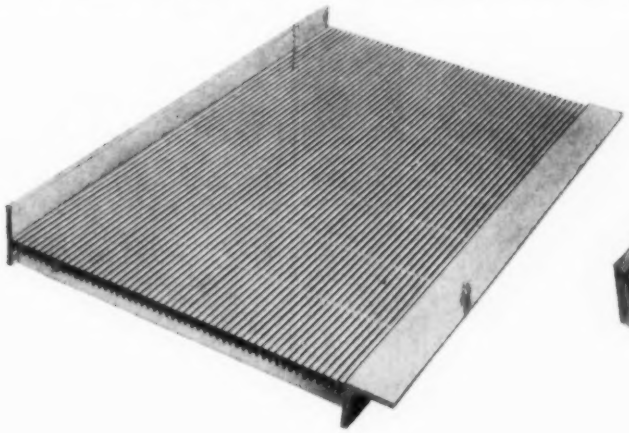
5307 W. Burnham St. Milwaukee, Wisconsin

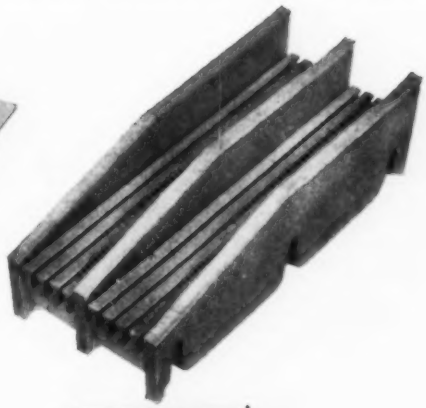
SALES . . . PARTS . . . SERVICE
Throughout the Nation

409RO



GET 5 IMPORTANT BENEFITS IN THESE HENDRICK SCREENS





1 REDUCED CLOGGING AND BLINDING

2 PRODUCT UNIFORMITY

3 FASTER PROCESSING

4 REDUCED WEAR FROM ABRASION

5 FABRICATION TO FIT YOUR OPERATING CONDITIONS

Perforated Plate with Hendrick H Quality Steel
Full clearance in Hendrick Perforated Plate practically eliminates blinding, permits faster processing. Uniformity of mesh provides product uniformity. Heat-treated H Quality high-carbon steel resists abrasion and screen damage.

Wedge Wire
Free clearance in Wedge Wire reduces chances of clogging and blinding. Tapered profile bar provides maximum water flow, increases dewatering efficiency. Deep profile bar stands up under extra-heavy loads, lengthens service life. Riffle tops are available for operating conditions involving highly abrasive materials.

Wedge Slot Screens
Accurately spaced, uninterrupted slots permit faster processing and dewatering, reduce chances of blinding. For product uniformity, parallel head flanges maintain uniformity of openings. For resistance to abrasion, Wedge Slot is available with Skid Bars that protect the screen against large chunks. Hendrick will gladly help you select, from 8 profile bars, the type that will stand up best under your operating conditions.

Hendrick
MANUFACTURING COMPANY
Headquarters for All Your Screening Needs
39 DUNDAFF STREET, CARBONDALE, PA.

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Open Steel Flooring • Shur-Site Treads • Armorgrids • Hydro Dehazers • Distillation Column Internals

Hendrick Manufacturing Co.
39 Dundaff Street, Carbondale, Pa.

Please send me your catalog on:

- ☐ H Quality Steel Perforated Plate
- ☐ Wedge Slot Screens
- ☐ Wedge Wire
- ☐ I would appreciate a call from a Hendrick Sales Engineer.

Name _____

Company _____

Address _____

City _____ Zone _____ State _____

Still ANOTHER Cottrell Advancement By Western Precipitation...

UNIQUE "FULL-RANGE" RAPPER CONTROL PROVIDES ENTIRELY NEW STANDARDS OF VERSATILITY

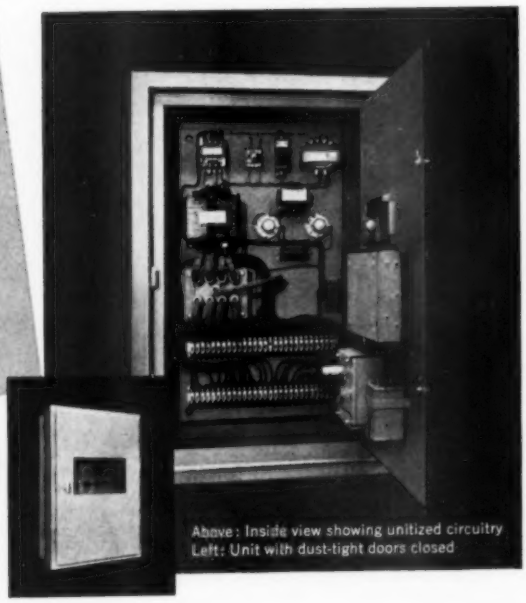
Rapping Frequency...Rapping Intensity...Rapping Pattern
ALL EASILY ADJUSTABLE TO MEET OPERATING REQUIREMENTS

THE PROBLEM:

In the operation of Cottrell Precipitators it is necessary to remove the dust, fume or fly ash that has collected on the plates and cause it to be deposited in a hopper for subsequent removal from the Precipitator. The Rapping System should accomplish this removal with minimum disturbance to the already collected material (to avoid re-entrainment) and with maximum cleaning of the plates.

However, collected materials vary widely in their physical characteristics. Some are sticky. Some agglomerate readily and in thick layers without disrupting electrical operation. Still others have no tendency whatever to agglomerate, but form a sheet of loose particles on the plate.

There is no "typical" dust—no fixed set of conditions to be met. **Yet the Rapper System must be readily adaptable to efficient dust removal, regardless of dust characteristics!**



Above: Inside view showing unitized circuitry
Left: Unit with dust-tight doors closed

THE SOLUTION:

With so many variables to be compensated, unusually wide adjustability of the Rapper System has long been a prime objective for optimum operating efficiency. But complex factors have prevented its attainment until development of Western Precipitation's new "Full Range" Rapper Control.

By simply adjusting a few dials, "Full Range" Control permits:

- **FULL FREQUENCY ADJUSTMENT**
  from a complete rapping cycle every 50 seconds to one every 3½ hours...or any desired cycle in between!
- **FULL INTENSITY ADJUSTMENT**
  from zero to maximum over an unusually wide range!
- **FULL PATTERN ADJUSTMENT**
  2, 4 or 8 impacts per cycle can be selected, with each cycle varying from light to heavy on successive impacts within the cycle—all automatically controlled to a choice of pre-selected operating limits!

Other Important Advantages...

Greater Safety: The "Full Range" Control has no dangerous high voltage circuits to endanger personnel. Entire unit is in "low-voltage" category.

All "Passive" Design: There are no motors, gears, or other high maintenance components in the "Full Range" Control. It is completely electronic.

Space-Saving Compactness: The "Full Range" Control requires about *half* the space of previous designs. Also is water and dust tight—can be located virtually anywhere.

Unitized Circuitry: All related parts are unitized into separate "cans" for simplified maintenance.

Free! NEW BROCHURE
which describes and illustrates the new "Full Range" Rapper Control—the latest product of Western Precipitation's program of continuous advancement!

For quick assistance, call or wire **collect** *our nearest office.*

A-M-101

COTTRELL Electrical Precipitators
MULTICLONE Mechanical Collectors
CMP Combination Units
DUALAIRE Jet-Cleaned Filters
THERM-O-FLEX Hi-Temp Filters
TURBULAIRE-DOYLE Scrubbers
HOLO-FLITE Processors
HI-TURBIANT Heaters

WESTERN
PRECIPITATION
CORPORATION

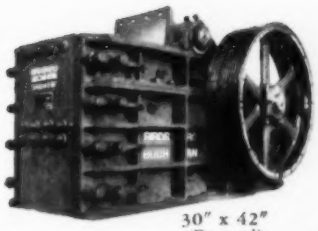
Engineers and Constructors of Equipment for Collection of Suspended Material from Gases . . . and Equipment for the Process Industries

LOS ANGELES 54 • NEW YORK 17 • CHICAGO 2 • PITTSBURGH 22 • ATLANTA 5 • SAN FRANCISCO 4

Representatives in all principal cities

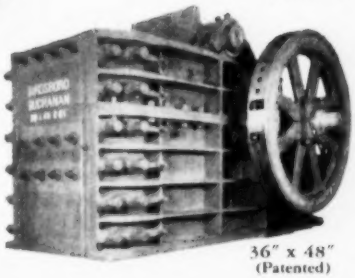
Precipitation Company of Canada Ltd., 8285 Mountain Sights Avenue, Montreal 9

Meet rising costs with
more tonnage *... specify*
deep-frame *jaw crushers*
by **BIRDSBORO-BUCHANAN**



30″ x 42″
(Patented)

12″ x 20″
(Patented)

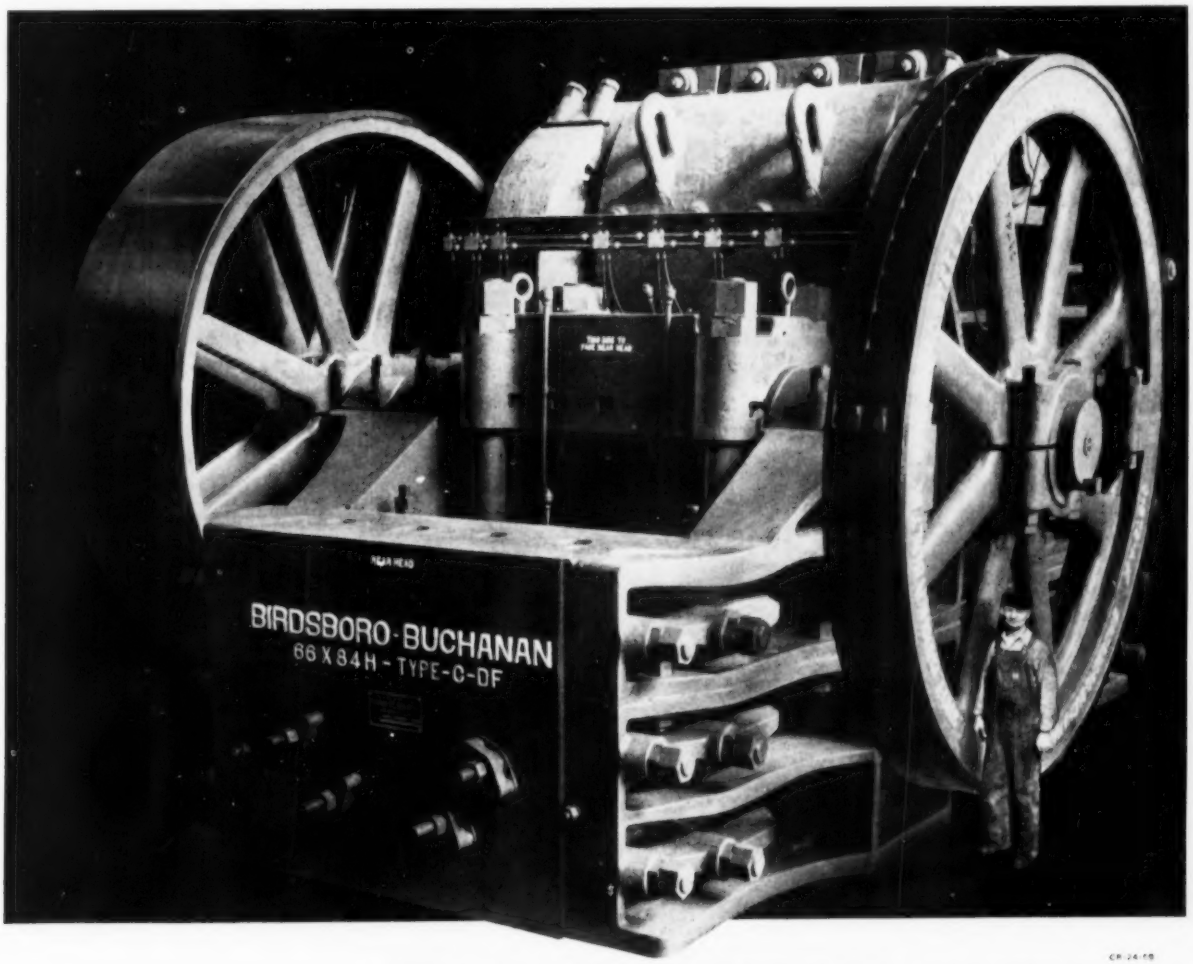


36″ x 48″
(Patented)

● The high tonnage crushing you get from BIRDSBORO-BUCHANAN Jaw Crushers stems directly from the DEEPER Frame and LONGER Swing Jaw. These features provide the DEEP Crushing Chamber that assures positive nipping action which minimizes slippage and results in a higher ratio of reduction and greater capacity with lower maintenance costs. Your Birdsboro representative has facts and figures. *Sales Department, Engineering Department and Plant:* Birdsboro, Pa., *District Office:* Pittsburgh, Pa.

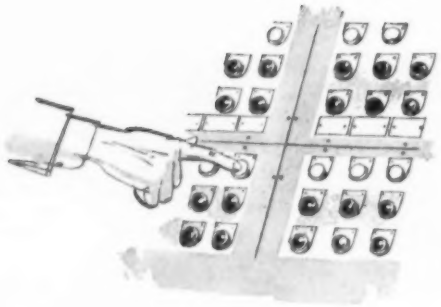
World-Wide Agent Representation. Contact home office for nearest representative.

Canadian Representative & Manufacturer: John Inglis Co., Ltd., Toronto, Canada.



BIRDSBORO
STEEL FOUNDRY AND MACHINE CO.

STEEL MILL MACHINERY • HYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY • STEEL CASTINGS • Weldments "CAST-WELD" Design • ROLLS: Steel, Alloy Iron, Alloy Steel



Fingertip control with

JEFFREY VIBRATING FEEDERS

...one man runs stone reclaiming operations, screening and washing plant, secondary crushers

Get details on how Jeffrey vibrating equipment and controls can simplify your materials handling job and save you money.

THIS quarry produces both high calcium limestone and dolomite products. From a strictly operating standpoint, *one man at a Jeffrey-designed control panel* runs the screening and washing plant, two secondary crushers and reclaiming operations monitored by 15 Jeffrey vibrating feeders.

Jeffrey feeders under primary surge piles feed stone to the plant via reclaiming tunnel belt conveyor. Vibrating grizzlies with bars on 3" centers allow fine material to fall to belt conveyors ahead of coarser stone, insuring longer life for the belt.

Jeffrey vibrating feeders were also selected for reclaiming finished stone from stockpiles. At these feeders, flow of stone actuates a swing baffle which signals control panel operator that material is flowing properly. Even blends of stone can be obtained by regulating flow from stockpiles to reclaiming belt ... through remote-controlled Jeffrey vibrating feeders.

Write for Catalog 930. The Jeffrey Manufacturing Company, 917 North Fourth Street, Columbus 16, Ohio.

CONVEYING • PROCESSING • MINING EQUIPMENT...
TRANSMISSION MACHINERY...CONTRACT MANUFACTURING

JEFFREY

As shale is dumped on the grade, the 4-in-1 instantly changes from big-capacity loader to material-moving bulldozer. The operator simply lifts the clam lip, hydraulically, to switch machine actions. He regulates dozing depth with positive accuracy, using "radius control" of blade. It takes a bonafide, full-size standard dozer to match this capacity!

"Back-Dragging" with exclusive clamshell action, the 4-in-1 reduces time and cost of "dressing" a bank and pulling down "slide" rock. TD-20 shuttle-bar control speeds up back-and-forth cycles on jobs like this. Using clamshell in this position also permits speedy pick-up of stumps or loose materials that give straight buckets trouble.

"Our TD-20 Four-in-One does jobs impossible for regular dozer or loader"

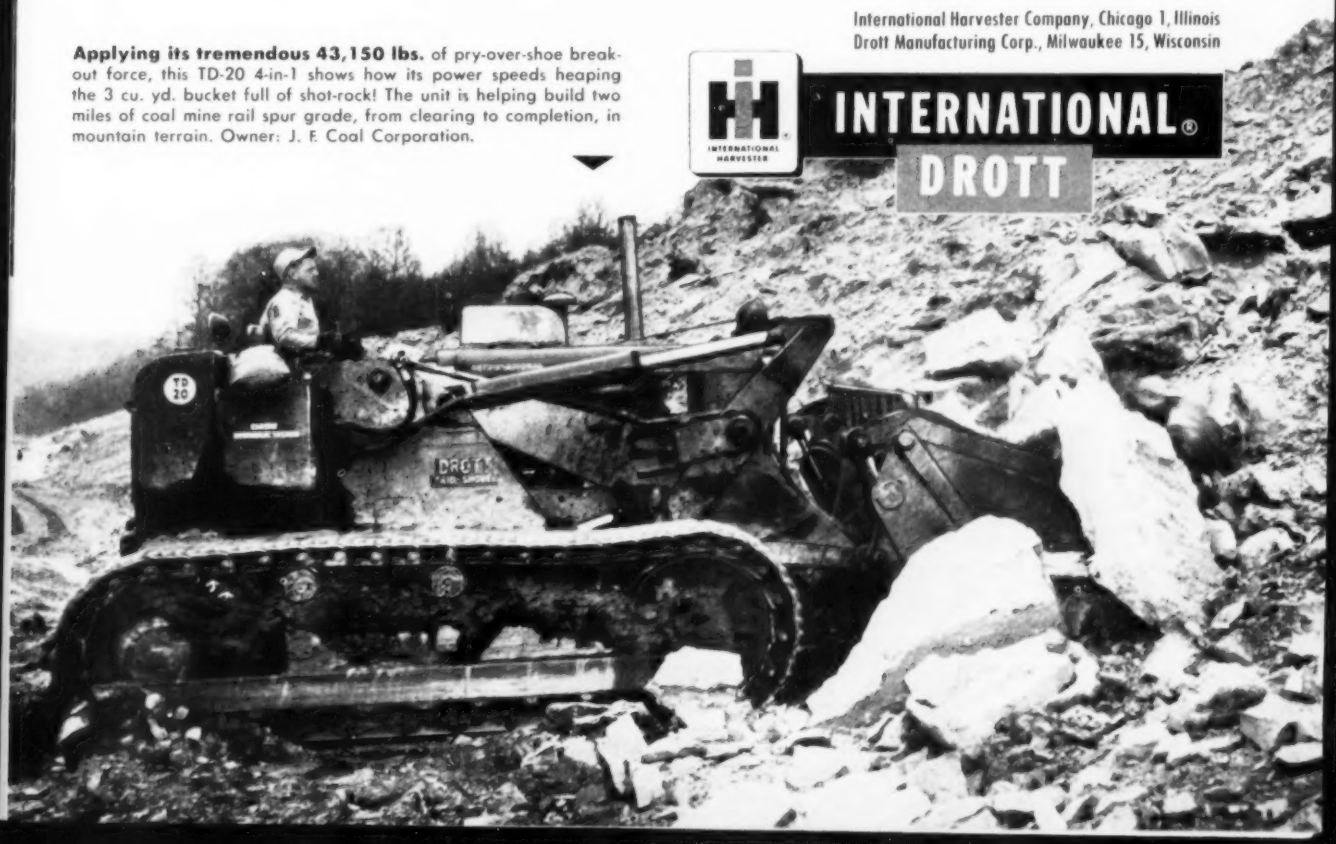
—J. F. Coal Corporation, Summersville, W. Va.

"We have used the 4-in-1 for practically all phases of this work, often doing jobs impossible with regular dozer or loader," reports Russell Patrick, Manager, J. F. Coal Corporation, Summerville, W. Va. Prove to yourself what it means to get four-machine utility—bulldozer, excavator-loader, clamshell, "carry-type scraper"—for one moderate investment. See how this "one-man equipment fleet" cuts operating cost and machinery investment—increases profit. Measure the performance-protection plus value of exclusive, shock-swallowing Hydro-Spring. See your International Drott Distributor for a 4-in-1 demonstration!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

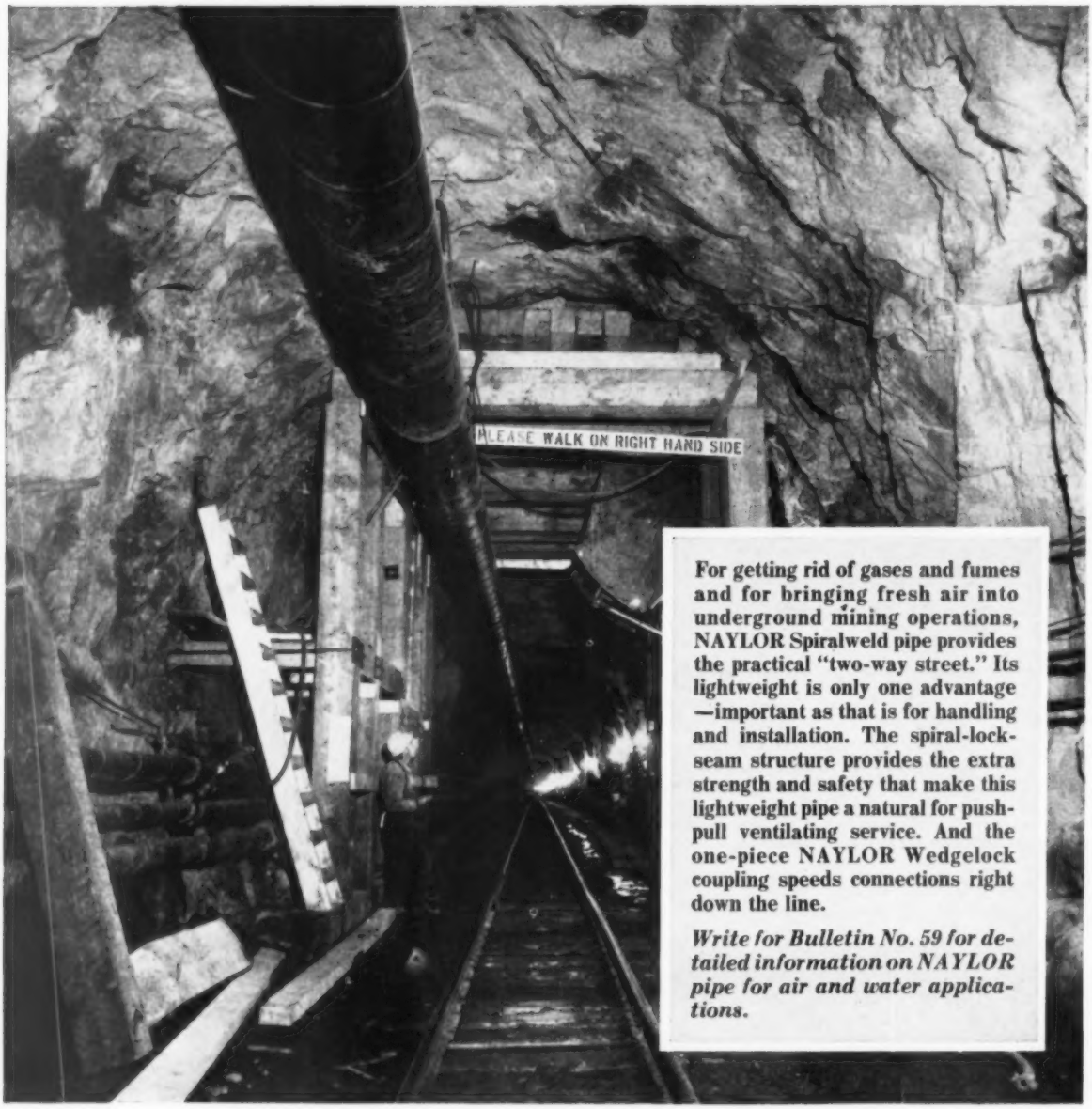
Applying its tremendous 43,150 lbs. of pry-over-shoe breakout force, this TD-20 4-in-1 shows how its power speeds heaping the 3 cu. yd. bucket full of shot-rock! The unit is helping build two miles of coal mine rail spur grade, from clearing to completion, in mountain terrain. Owner: J. F. Coal Corporation.

INTERNATIONAL®
DROTT



TWO-WAY STREET

For Ventilation



For getting rid of gases and fumes and for bringing fresh air into underground mining operations, NAYLOR Spiralweld pipe provides the practical "two-way street." Its lightweight is only one advantage —important as that is for handling and installation. The spiral-lock-seam structure provides the extra strength and safety that make this lightweight pipe a natural for push-pull ventilating service. And the one-piece NAYLOR Wedgelock coupling speeds connections right down the line.

Write for Bulletin No. 59 for detailed information on NAYLOR pipe for air and water applications.

NAYLOR PIPE *Company*

1257 East 92nd Street, Chicago 19, Illinois

Eastern U. S. and Foreign Sales Office: 60 East 42nd Street, New York 17, N. Y.

Three tons extra payload. Capacity of this trailer built of USS MAN-TEN High-Strength Steel is 21 tons of stone compared to 18 tons for an older unit having the same loaded weight. Because of USS MAN-TEN Steel's greater strength, thinner sections were used with no loss of strength. Built by Perfection Steel Body Company and sold by the Carnegie Body Co. to the Cleveland Limestone Company, North Olmstead, Ohio.

$60,800 extra profits a year earned with USS High Strength Steel trailers

This story sounds too good to be true but it's based on well-established facts. The Cleveland Limestone Company bought ten new dump trailers built lighter with high-strength steel—mostly USS MAN-TEN. Compared to the old units, each trailer hauled an *extra* payload of three tons and made four trips per day. According to Mr. Robert Arundel, President of the firm, the extra payload for the whole fleet adds up to $304 more profit per day—or $60,800 per year!

Maintenance costs reduced. Maintenance on the new units has been negligible and any repairs necessary on the all-steel bodies could be made at minimum cost.

Versatility. The new trailers can do things not thought possible, such as dumping atop a 40-foot pile of stone and spreading a load of stone over a road bed. The drivers do it regularly without incident.

Greater durability. A real test of the trailer's durability is the loading operation. Six to ten tons of stone drop a distance of 20 feet to the trailer bed. No serious damage has resulted from this rough treatment.

Life expectancy. Each unit makes four 150-mile trips every 24 hours and hauls a total of 84 tons. The life expectancy, according to the truck foreman, will be a minimum of 16 to 20 years because of the high strength and abrasion resistance of USS MAN-TEN Steel.

USS High-Strength Steels are widely used for all types of aggregate handling equipment. They have a minimum yield point of 50,000 psi and assure longer life and lower operating costs. USS MAN-TEN Steel is noted for high strength with economy; USS COR-TEN Steel . . . high strength with corrosion resistance; USS TRI-TEN Steel . . . high strength with toughness. And where *very* high yield strength is needed, USS "T-1" Constructional Alloy Steel is furnished with a minimum yield strength of 100,000 psi, plus high resistance to impact abrasion. For more information about any of these steels, contact our nearest sales office or United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

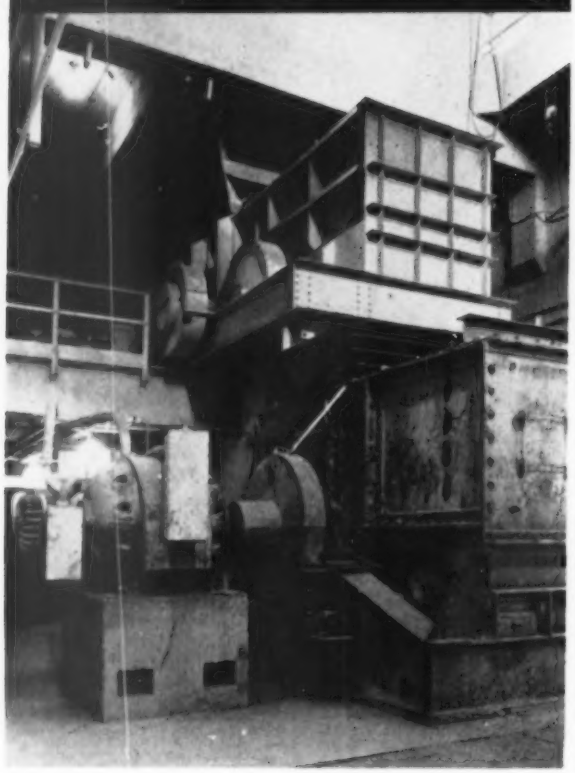
USS, MAN-TEN, COR-TEN, TRI-TEN and "T-1" are registered trademarks

USS

United States Steel Corporation — Pittsburgh
American Steel & Wire — Cleveland
Columbia-Geneva Steel — San Francisco
Tennessee Coal & Iron — Fairfield, Alabama
United States Steel Supply — Steel Service Centers
United States Steel Export Company

United States Steel

Another size reduction problem solved by Hammermills, Inc.



Non-Clog Bulldog Hammermill

Crushes 400 T.P.H. from 42" to 1" and under

This non-clog BULLDOG HAMMERMILL takes feed ore 42" and under containing 22% moisture, 13-15% silica. It reduces this material to a fineness of 1" and under at a rate of 400 tons per hour using only 400 h.p. Over the past 5½ years, the Bulldog Hammermill crushed an average of 166,500 tons between hammer resurfacings. Maintenance costs were only .0014 per ton.

Hammermills, Inc. can help you reduce the cost of your end product. For the name of the Hammermills' representative in New York, Chicago, St. Louis, Toledo, Dallas, Denver, Los Angeles and Melbourne, Florida, write us.

Manufacturers of: Hammermills for Primary and Secondary Crushing • Impactors • Jaw Crushers • Roll Crushers • Cone Crushers • Wobbler Feeders • Apron Feeders

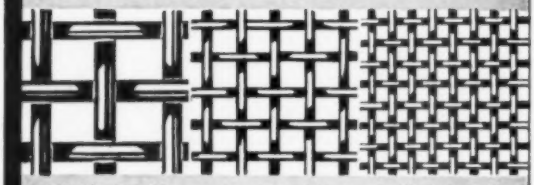
HAMMERMILLS, INC.

Subsidiary of PETTIBONE Mulliken Corp

625 C Ave. N.W., Cedar Rapids, Iowa

Enter 230-A on card, page 139

STRONG AS ARMOR
NAT-ALOY
Woven Wire Screens



Reliable Nat-Aloy woven wire cloth is specified throughout industry for maximum screening accuracy and economy. Available in flat surface, lock crimp, double crimp, rectangular and long slot openings. All sizes, meshes and gauges—prompt shipment.

WE OFFER NOW... SUPER NAT-ALOY OIL TEMPERED WOVEN WIRE CLOTH

★ GREATER RESISTANCE TO ABRASION
★ MORE TONNAGE AT LOWER COST
★ FEWER COSTLY CHANGE OVERS

Write for information. Also stainless steel wire screens.

NATIONAL WIRE CLOTH COMPANY
252 W. Fairfield Ave., St. Paul 1, Minnesota

Enter 230-B on card, page 139

DREDGING PROBLEMS?

Van Gorp's "AGGRETATOR" is designed to increase production with a small investment

OUTSTANDING BENEFITS

How many tons of material do you loose every year in your dredging operation because of bad pumping conditions? Such as clay seams, large rocks or a cemented deposit. These conditions, of course, greatly reduce your dredging efficiency.

The Van Gorp "AGGRETATOR" will cut through clay seams, will push large rocks away from the suction nozzle and will loosen a cemented deposit.

The "AGGRETATOR" is easily installed on your present suction line. Existing power will be adequate to drive the hydraulic pump, and it is not necessary to build an expensive boom or to build a larger barge.

SIZES... Available For 6", 8", 10" or 12" SUCTION LINES.

WRITE FOR *Free* BROCHURE

Van Gorp Mfg. Inc.

BOX 123 • PELLA, IOWA

Enter 230-C on card, page 139

"This 2-yd Loader Gives Us the REACH We Need at $2,000 to $3,000 Savings on Purchase Price"

"With our crushed stone and lime loading specifications running in excess of 1,000 tons per day," asserted Mr. Walter Van Gorden, treasurer-manager, Cave Stone Company, Cave Indiana, "our requirements on loading equipment are as critical as on any of our manufacturing units. All of the efficiency and production engineered into our excavation and processing equipment is of little value if we cannot maintain like values on the delivery end.

"Because of this, we investigated every available loader on the market before buying our TL-20 TRACTOLOADER* in September, 1957. This decision was made on the basis of actual tests with each piece of equipment which indicated that the TL-20 consistently operated faster, reached farther, lifted higher and gave us more pounds per bucket than anything else in its class. *We would have had to spend $2,000 to $3,000 more for a machine which would equal its production potential.*

"Our two primary requirements for a loader are height and reach. If bucket capacity were our only concern, we could have approached the load of our present unit by simply buying a larger machine of the same make as our previous one. The TL-20 was the only one available in this price class with a two-yard capacity, but, *more important, was the height of the lift and the length of the reach.* With competitive machines, we would have to load the 8 to 14-ton trucks from both sides to get maximum load and balance. The TL-20, on the other hand, has a dumping height of 9 ft with a reach of 34 in. at this height. This increase means that we can easily load from one side without damaging the truck or holding up the driver over 4 minutes.

"Now, with this one machine, we are handling 80% of our loading, and have not yet extended it to its limits. We have yet to become involved with any type of maintenance other than the normal routine upkeep required on any piece of mechanical equipment. In spite of the rugged nature of the application, we expect a minimum of 5 years' service from the unit, and in all probability will replace it with an identical loader."

Let your Allis-Chalmers dealer show you how TRACTOLOADERS can increase your production.

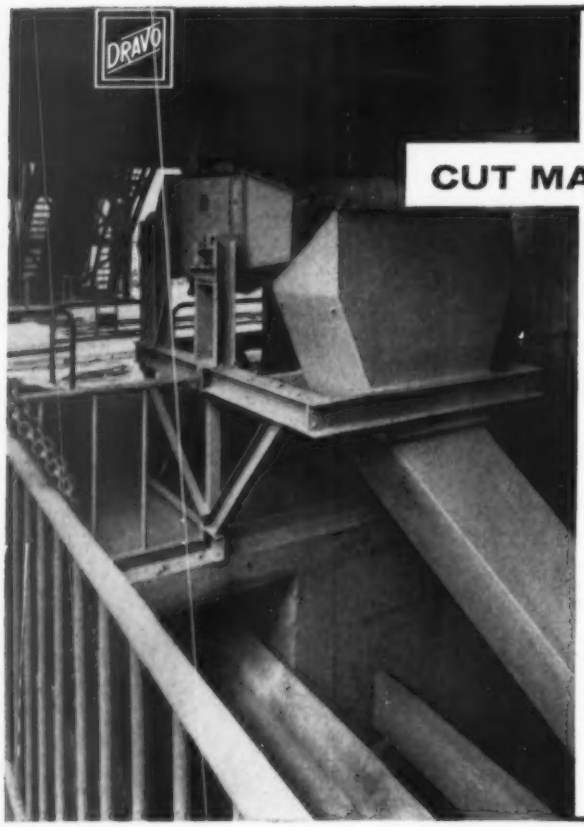
*TRACTOLOADER is a registered Tractomotive trademark.

ALL TRACTOMOTIVE EQUIPMENT IS SOLD AND SERVICED BY YOUR ALLIS-CHALMERS DEALER

TRACTO—
a sure sign
of modern design

TRACTOMOTIVE
TRACTOMOTIVE CORPORATION • DEERFIELD, ILLINOIS

TRACTOLOADERS • TRACTOSHOVELS • TRACTORIPPERS • TRACTOHOES • TRACTOSIDEBOOMS



Dravo-Schenck Vibro-Feeders CUT MATERIALS HANDLING COSTS

Because it is built to stand up under the kind of punishment that hot, abrasive or other hard-to-handle materials deal out, Dravo-Schenck vibro equipment keeps maintenance costs way down. All wearing parts are ruggedly constructed, and the unique "Micro-Thrust" exciter unit helps reduce wear by moving material with minimum contact with troughs or screens.

Cost-cutting, heavy-duty Dravo-Schenck screens, conveyors and feeders are at work in a wide variety of applications—handling such difficult materials as ferrous and non-ferrous ores, sinter, cement clinker, crushed stone, chemicals and coal.

Our engineers will gladly work with you on specific problems. For information, write for Bulletin No. 1475, Dravo Corporation, Pittsburgh 25, Pa.

DRAVO
CORPORATION

Freely oscillating vibro-feeder, 3 x 7 ft, rated at 200 tph. This type of heavy-duty feeder is available with capacities in excess of 800 tph.

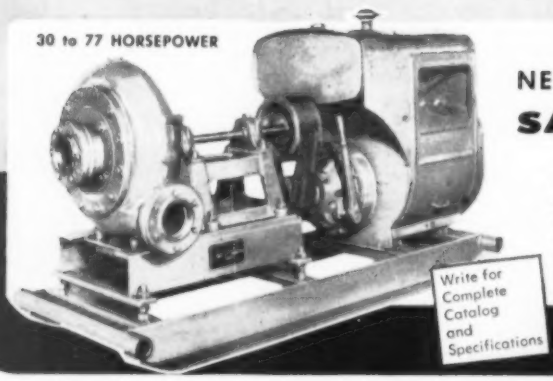
Enter 232-A on card, page 139

DEPENDABLE FOR 60 YEARS
Woven Wire
ALLOY SCREENS
TWIN CITY IRON & WIRE CO.
St. Paul, Minnesota

Enter 232-B on card, page 139

CONTRACT CORE DRILLING
EXPLORATION FOR MINERAL DEPOSITS
INCLUDING URANIUM & LIMESTONE — ANYWHERE
FOUNDATION TEST BORING
GROUT HOLE DRILLING
Skilled crews and complete stock of core drills and accessory equipment maintained at all times
Core Drill Contractors for more than 60 years
JOY MANUFACTURING CO.
Contract Core Drill Division
MICHIGAN CITY, INDIANA

Enter 232-C on card, page 139



NEW *Lightning* PORTABLE
SAND & GRAVEL PUMPS
4 AND 6 INCH SIZES

New design for a wide variety of uses and pumping conditions. 4-inch pump has 30 H.P. air-cooled engine; 6-inch pump has 6-cylinder radiator cooled engine. All wearing parts are of Hi-Chro-Hi, a super hard, abrasion resisting semi-steel. Maintenance is negligible, parts replacement is simple.

KANSAS CITY HAY PRESS CO.
Manufacturers of Heavy-Duty Lightning Sand and Gravel Pumps
801 WOODSWETHER ROAD • KANSAS CITY, MISSOURI

Enter 232-D on card, page 139

Four reasons why this NI-HARD cast drop ball is a smash hit!

This Ni-Hard* cast iron drop ball is dedicated to a long life "on the rocks." Its service record – and that of other GIW Ni-Hard drop balls produced by the Special Products Division of Georgia Iron Works, Augusta, Ga. – has proved to be *four* times longer than that of any other type ball. In fact, most GIW Ni-Hard balls have replaced forged steel balls. Here are four reasons why:

• **Design.** Notice the design of the ball. It has been quoted to be so well balanced that the operator is able to lift and drop the ball more times per shift. One operator stated that his overtime was eliminated when he started using Ni-Hard balls.

• **Abrasion resistance.** Ni-Hard is one of the hardest commercial products of the iron foundry, possessing outstanding abrasion resistance. This important property enables Ni-Hard balls to withstand the severest wear of the hardest rocks.

• **Strength and toughness.** In addition to abrasion resistance Ni-Hard drop balls are tough enough and strong enough to withstand impact in this most demanding operation. They resist breaking or chipping.

• **Economy.** Only a Ni-Hard *cast* drop ball could be economically produced to take advantage of the money-saving features mentioned above. And, of course, the long service life of Ni-Hard drop balls means greater operating economy.

Put these Ni-Hard advantages to work for you. Next time you buy drop balls, get in touch with a Ni-Hard producer. There's one near you. If you don't have his name, write Inco for a list of authorized Ni-Hard producers.

*Registered trademark

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

INCO

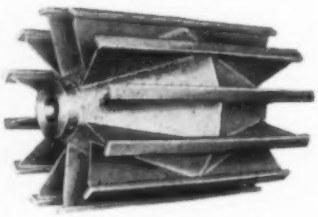
NI-HARD

NICKEL MAKES ALLOYS PERFORM BETTER LONGER

REDUCE Material Handling Costs WITH ELEVATING and CONVEYING EQUIPMENT by STANDARD METAL

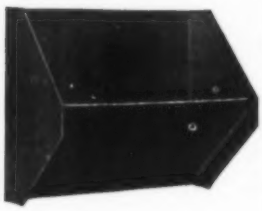
WING-TYPE SELF-CLEANING PULLEY
Lower Cost, Stronger, Longer Lasting

Reinforced all-steel welded construction of this pulley provides longer service, lower operating costs, greater efficiency. Built to deliver maximum service under severe operating conditions, Standard Metal's Self-Cleaning Pulley combines greater strength with less weight.



CONTINUOUS ELEVATOR BUCKET—STYLE #2
Exceptional Resistance to Wear

This style of bucket is just one of several types of rugged, longer lasting, low-cost steel elevator buckets manufactured by Standard Metal. Available in Salem, Style "A," Shelf Type and other continuous style buckets for all types of operations.



GEAR-OPERATED BIN GATE
Easy-to-Operate for Greater Output

This Standard Metal Bin Gate has all-steel welded construction for longer life. It is fast and efficient, helps reduce handling costs. Other styles of bin gates by Standard Metal also are available.

Write today for details and quotations on your needs in elevating and conveying equipment for new installations or replacements. Request our complete catalog, too.

SM7

The Standard Metal Mfg. Co. SINCE 1921

STANDARD METAL MFG. CO.
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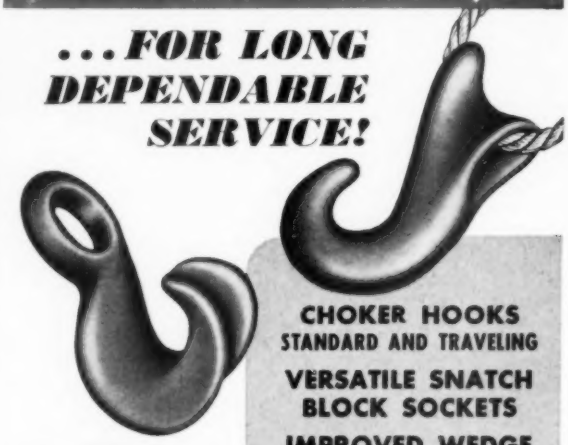
...FOR LONG DEPENDABLE SERVICE!



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. . . . . All sizes of heavy duty wire rope fittings are in stock for shipment within 48 hours after receipt of your order!

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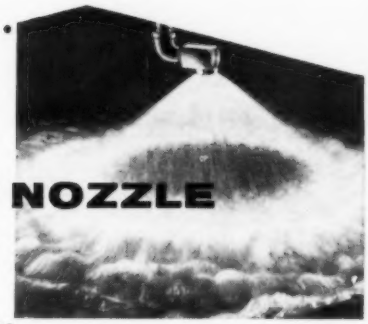

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For almost every spraying application, there's a Spraying Systems Data Sheet that gives useful information on suggested installations and types of nozzles to use. If you have a problem, write and let us know the application involved . . . and we'll send the Data Sheet that applies.

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And . . . for complete spray nozzle information, write for Catalog 24.

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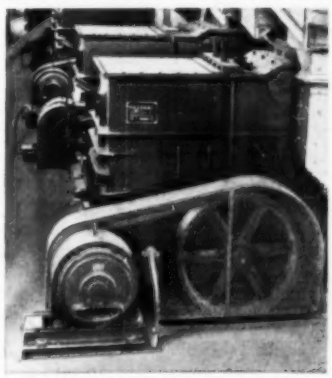

View of an Asbestos Milling Plant in Canada incorporating ten AP 4 HAZEMAG Impactors (Andreas system) rated at 60 TPH each.

Leading Asbestos Mines throughout the world rely on HAZEMAG Impactors (Andreas system) for profitable solution of their milling problems!

HAZEMAG Impactors greatly simplify the flowsheet by eliminating several milling stages.
Thanks to their selective action HAZEMAG Impactors open the fiber by crushing only the serpentine or rocky portion of the feed.
HAZEMAG Fiberizers open the asbestos without shortening the fiber or causing damage to its structure, so as to furnish a high-grade fiber product.
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MECO
SINCE 1910

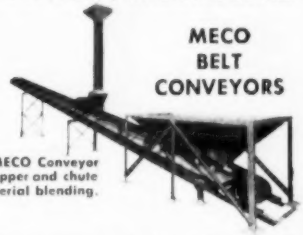
. . . the answer to your CONVEYOR and ELEVATOR PROBLEMS

Whatever the characteristics of the materials to be handled . . . the need for equipment which will withstand hard and constant service . . . the limitations of space . . . MECO can supply the answer to your conveyor and elevator problems!

MECO Conveyors and Elevators are designed, engineered, and manufactured *to your specific requirements and application*—embody all the features and advantages gained in nearly one-half century of experience in the design and manufacture of material handling equipment.

MECO Conveyors and Elevators are your assurance of efficient, economical operation and long years of reliable, trouble-free service.

MECO BELT CONVEYORS



MECO Conveyor with hopper and chute for material blending.

MECO Conveyors are designed for the efficient handling of practically all bulk materials; light or heavy; wet or dry; granular or lumpy. The available width of belts, the many kinds of material that may be handled, and the varied permissible speeds at which they may operate, combine to produce a broad range of capacities. MECO Conveyors can be made to operate over short or long distances; horizontally or on inclines. All idlers and pulleys are balanced. Belt idlers have smooth surfaces and rounded edges to prevent damage and provide for longest belt life. Available as complete units with framing, or in component form for purchaser assembly.
Write today for Bulletin No. 576

MECO BUCKET ELEVATORS

MECO Bucket Elevators are available for handling crushed or ground materials, either as Continuous Bucket or Centrifugal discharge types; chain or belt. Especially designed to withstand rugged and prolonged service requirements, MECO Elevators are furnished with solid steel head pulleys and extra heavy-duty slatted steel self-cleaning tail pulleys. Where housings are furnished, convenient outlet doors are provided for removing material accumulation. All MECO Elevators are powered through compact torque arm drives.
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MECO Centrifugal discharge Elevator, feeding conveyor.

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PRODUCER

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Standard of the Aggregate Industry in Meeting Rigid Specifications with the Heavy Media Separation Process

The successful operator today reaches beyond the safety factor — to meet the toughest aggregate specifications. He protects himself with quality that will more than meet inspection — however critical.

Treatment of unusuable deposits can result in the production of a premium aggregate at surprisingly low cost. Coal, shale, chert, clayballs and other unacceptable materials are literally floated away.

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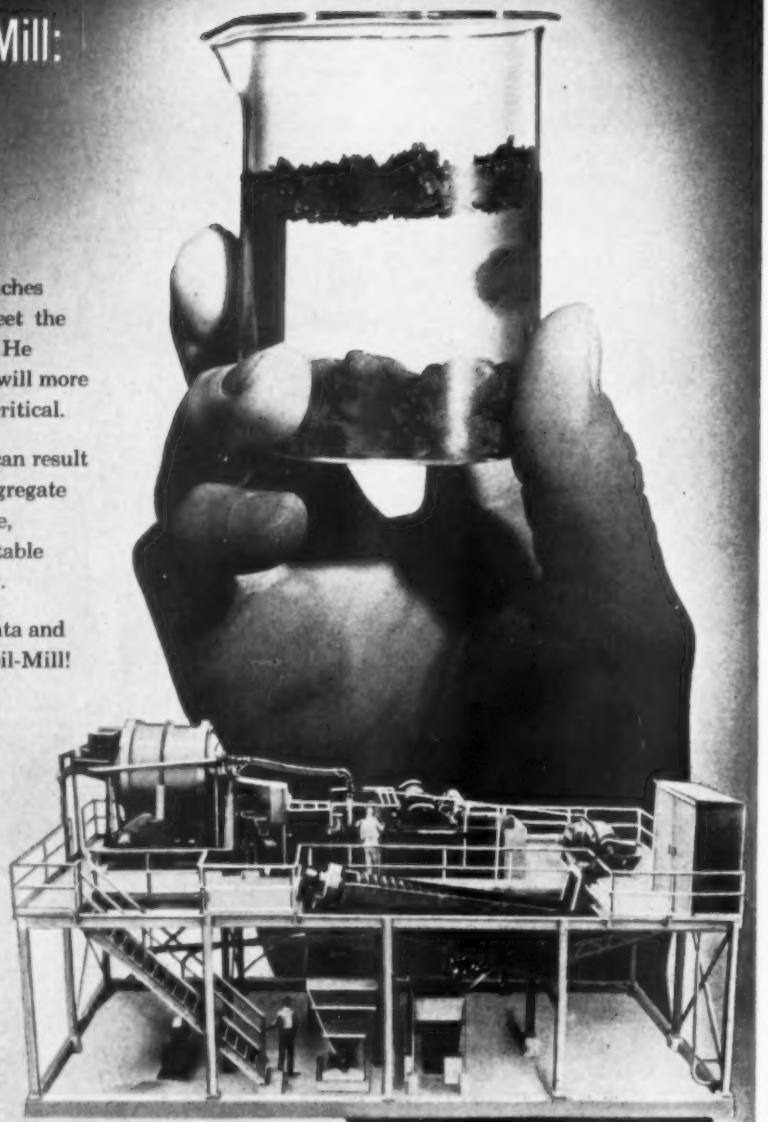

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BONDED ® TROUGHING IDLER CONVEYOR BARGAINS BUILT FOR ECONOMICAL INSTALLATION AND ENDURANCE

CONVEYOR PRICES INCLUDE BELTING

Complete Pre-Fab sections of 8" Jones & Laughlin Jr. I Beam Frame Conveyors quickly and easily joined together on the job. These beams are rolled with .20% Copper Content. Atmospheric exposure tests disclose that Junior Beams with .20% Copper have as much as four times the resistance to corrosion as non-copper steels. Braced with structural angle, welded to frame for maximum rigidity. Equipped with 5" roll diameter idlers and return rolls, 20" diameter head pulley and 16" diameter tail pulley, mounted on 2¼" or 2 7/16" diameter shaft.

We take our loss on our stock of short length belting. You can save as much as 50% on BONDED CONVEYOR SPECIALS, with conveyor belting in two pieces. Belt is new 4-ply, 28 oz. duck, ⅛" top rubber cover x 1/32" bottom cover Major grade belt and is Fresh Stock made by leading manufacturers. **WRITE FOR BULLETIN #1138.**

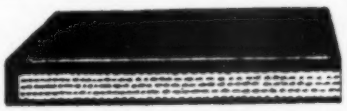
Bonded troughing idler conveyors also available in Truss Frame Construction. **WRITE FOR BULLETIN #1189 AND PRICES.**

A full line of accessories available, including carrying and return belt covers.

Belt Width	Length of Conveyor	List Price	Sale Price	Add or Deduct Per Foot
14"	25'	$1397	$ 738	
14"	50'	2222	1159	$16.84
14"	85'	3377	1748	
16"	20'	1262	667	
16"	45'	2137	1118	18.04
16"	60'	2662	1388	
16"	90'	3712	1930	
18"	25'	1477	797	
18"	45'	2217	1182	
18"	70'	3142	1663	19.24
18"	85'	3697	1952	
18"	100'	4252	2240	
18"	130'	5362	2817	
20"	25'	1517	835	
20"	60'	2882	1548	20.37
20"	75'	3467	1854	
20"	90'	4042	2159	
24"	25'	1590	898	
24"	45'	2430	1334	
24"	70'	3480	1878	21.78
24"	100'	4740	2532	
24"	120'	5580	2967	
24"	150'	6840	3621	
30"	50'	2911	1617	
30"	70'	3871	2112	24.75
30"	90'	4831	2607	
36"	25'	1818	1118	
36"	45'	2858	1677	27.95
36"	60'	3638	2096	
36"	100'	5718	3214	

TESTED CONVEYOR BELTING AT NEW LOW PRICES

WE PAY FREIGHT ON 200 POUNDS OR OVER



Major Brand: 12# to 15# Average Friction Pull. 800# to 1000# Average Cover Tensile. Heavy Duty 4-ply, 28-oz. duck, ⅛" top rubber cover x 1/32" bottom rubber cover belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stocks.

Width	Ply	List Price Per Ft.	Sale Price Per Ft.
14"	4	$3.63	$2.83
16"	4	4.09	2.97
18"	4	4.51	3.29
20"	4	4.97	3.80
24"	4	5.85	4.26
30"	4	7.18	5.21
36"	4	8.51	6.18

Major Bee Brand: 16# to 19# Average Friction Pull, 2400# to 3000# Average Cover Tensile. Skim coat between plies.

A high grade of heavy duty 4 and 5-ply, 28 oz. duck, ⅛" top rubber cover x 1/32" bottom rubber cover. These belts are for more severe service, high tonnages and abrasion resistance. For handling stone, mineral ores, concrete, cement, coal, and other similar materials, both wet and dry. Belts have molded rubber edges.

Width	Ply	List Price Per Ft.	Sale Price Per Ft.
14"	4	$4.31	$3.06
16"	4	4.85	3.46
18"	4	5.39	3.83
20"	4	5.90	4.37
24"	4	6.94	4.94
30"	4	8.53	6.07
36"	4	10.09	7.35
24"	5	8.14	5.78

***All belting is tested by the Engineering laboratory of one of the largest universities in the United States. It is guaranteed to meet or exceed listed specifications.**

Other widths, plies, duck weights and cover thickness available at low prices. **WRITE FOR FREE SAMPLE AND BULLETIN.**

BONDED® QUALITY BUILT BUCKET ELEVATORS

ENCLOSED ELEVATOR

Open or Enclosed, Vertical or Inclined Bucket Elevators with Continuous or Spaced Buckets mounted on Chain or Belting. Bonded's 19 standard models mean lower prices and you get a Custom Built Elevator at no extra cost. Prices listed below are for Vertical Enclosed Elevators. Open and other types prices on request. There is a style of bucket for virtually every material or condition, wet or dry, lumpy or fine, granular, slivery, or pellet shapes, hot or chemically active.

Standard Elevators with Chain mounted buckets use #477 or #C102B combination chain. 4, 5 and 6 ply, 32 oz. or 35 oz. duck belt is used on Belt mounted Bucket Elevators. A complete line of parts and accessories available to build your own Bucket Elevator.

WRITE FOR BULLETIN #1203

Model No.	Bucket Size Inches	First 20' (Discharge Ht.)	Add or Deduct Per Ft.
Style "A" Spaced Malleable Buckets on Chain			
C53A	5 x 3¾	$1071.50	$20.25
C84A	6 x 4	1088.50	21.00
C85A	8 x 5	1235.00	25.50
C106A	10 x 6	1281.00	27.50
C127A	12 x 7	1510.00	31.25
C148A	14 x 8	1673.50	36.00
Style "A" Spaced Malleable Buckets on Belt			
B53A	5 x 3½	$1099.00	$20.50
B64A	6 x 4	1116.50	21.25
B85A	8 x 5	1311.50	27.25
B106A	10 x 6	1692.50	33.00
B127A	12 x 7	1854.50	37.25
Style "E" Continuous Steel Buckets on Chain			
C85E	8 x 5 x 7¾	$1397.00	$31.25
C126E	12 x 6 x 11¾	1598.00	34.25
C108E	10 x 8 x 11⅝	1604.00	34.75
C128E	12 x 8 x 11⅝	1624.00	35.50
C148E	14 x 8 x 11⅝	1710.00	36.75
Style "E" Continuous Steel Buckets on Belt			
B85E	8 x 5 x 7¾	$1727.50	$34.50
B116E	11 x 6 x 8¾	1839.50	38.75
B128E	12 x 8 x 11⅝	2013.00	43.50

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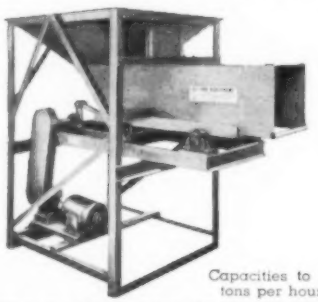
Capacities to 60 tons per hour

EF Series Pan Feeders Priced From $224.00



Capacities to 440 tons per hour.

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Bonded EF Series Economy Feeders are ideal for confined spaces and in portable plants. For medium duty service. Available with or without hoppers.

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BONDED FEEDERS are process control instruments as well as material movers. They are essential to the production of a uniform product by helping screens, crushers and other equipment from being run empty, choke-fed, or overloaded. Also needed ahead of conveyors to prevent belt damage due to the improper impact of belt loading. Can be driven from tail shaft of conveyor, eliminating necessity of two motors. Quick, easy, and economical installation. **WRITE FOR BULLETIN #1211.**

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3-roll, 5" diameter Troughing Idlers for:			
14" belt	$19.75	24" belt	$22.75
16" belt	20.50	30" belt	23.85
18" belt	21.90	36" belt	24.90
20" belt	22.10	48" belt	27.50
1-roll, 5' diameter Return Idlers for:			
14" belt	$7.25	24" belt	$ 8.50
16" belt	7.50	30" belt	9.50
18" belt	8.00	36" belt	10.00
20" belt	8.25	48" belt	11.50

All steel. Interchangeable with other well-known makes. Furnished with replaceable prelubricated sealed ball bearings. Maintenance is negligible. **WRITE FOR BULLETIN #1138.**

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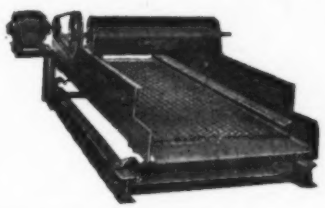
BONDED® VIBRATING SCREENS

PROMPT SHIPMENT OF ALL MODELS

GENERAL DUTY SCREENS

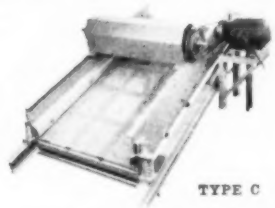


PERFECT BALANCE AND SHARP ACTION. Eccentric weight mechanism, spring mounted, 1 to 3 decks, 2' x 4' to 3' x 8'. **WRITE FOR "SEVEN SECRETS OF SUCCESSFUL SCREENING" IN BULLETIN NO. 1086.**

For the accurate and economical screening of sand, gravel, crushed stone, ores, broken rock, slag, clay and cement products and lightweight aggregates. All Bonded Screens built of structural steel, welded and reinforced with additional members on all points of strain and factory tested and balanced. Available in enclosed models where dust and flying particles need to be contained. For almost any type of screening operation, wet or dry.

Priced from $443

SPECIAL SERVICE SCREENS



TYPE C

WRITE FOR BULLETIN #1224

For scalping middle-range pieces and accurate sizing of fines and above listed products but where quantity and feed do not warrant a larger capacity, heavy duty model. Medium to heavy construction. Can also be suspended from four steel cables and springs for portable or temporary installation. Vibration remains in working screen body. No shaking of tipple, building or platform.

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HEAVY DUTY SCREENS

FACTORY BALANCED, CONTROLLED VIBRATION. Four bearing positive throw eccentric shaft; 3' x 6' to 5' x 14', 1 to 5 decks. **WRITE FOR BULLETIN NO. 1087 AND 9 REASONS WHY BONDED IS YOUR BEST BUY.**

For high tonnages, heavy scalping and mul sizing of such minerals and industrial p ducts as handled by above models. No dead spots. Springless live-rubber mounting of screen body controls vibration. Screen cloth and plate in all models reversible for longer life. Their finished edges prevent plates from splitting and cloth from ravelling.

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This business is located in one of the most progressive states of Mexico.

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Because the owner is 76 years old and his health is failing, he needs one or several partners.

The construction of several plants is almost completed. He also owns part of the machinery to construct a cement plant. If you have all or part of the machinery to construct a 250 to 500 tons daily capacity cement plant, you will need very little capital to invest. *For full information write to:*

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Leesburg, Florida

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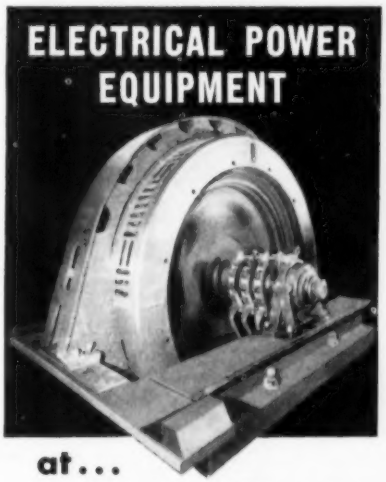

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26 Park St., Montclair, N. J.
29 Washington Ave., Hamden, Conn.
Phone Montclair—Pi 6-1300

OUR 51st YEAR

Butler Port. Bulk Cement Plant with 70 Yd. Hopper, 250 BBL Elev., Weigh Batcher, Scales, Vibrators, Etc.
Cedar Rapids 25 Yd. Secondary Portable Crushing Plant.
Acme Jaw Crusher 9" x 16"
Reliance Jaw Crusher 9" x 16"
Single Roll Coal Crusher 24" D. x 30" F.
Robins 18" x 24" Double Roll Crusher, Knobs.
Sturtevant #1½ Rotary Crusher
New England 14" x 28" Jaw Crusher
Farrel 10 x 4 "C" Jaw Crusher w/motor.
American 13SC Hammermill, 25 HP West.
Jeffrey Type A Hammermill 24" x 18".
Asphalt Dryer, 4' x 35', Complete.
Small Dust Elevators for Asphalt Plants, 5" and 6" buckets.
F44 Syntron Feeder and controls.
12" x 24" lg. Magnetic Belt Separator.
24", 26" & 30" Conveyor Belt, almost new.
1920 Ft. 36" New Belt, Neoprene.
400 Ft. 16" New Belt @ $2.00 ft.
Conveyor Idlers—All Sizes and Makes.
Steel Grating for Walkways, 95% New.
25, 30, 40 and 50 H.P. Motors.
50 H.P. 100 R.P.M. Gear Motors.
Sturtevant 20 HP Positive Pressure Blower
Hummer 1-Deck Screen 6' x 5'
Hummer 2-Deck Screen, 3' x 5' Encl.
Niagara 1-Deck Screen, 2½' x 12'.
Seco 3 x 8 3-Deck Screen, 5 HP TEFC
Seco 3 x 8 3½ Deck Screen
Revolving Screen 30" x 19' Lg. 4 sizes.
Revolving Screen 48" x 20', trunnions,
New Universal Screens in Stock.

G. A. UNVERZAGT & SONS INC.

136 Colt Street Irvington 11, N. J.
Essex 3-8105

KOEHRING 1005 Shovel, 2½ cy., #6509, w/almost new Buda 6DC1849 diesel, reconditioned, appearance excellent. $22,000 Rental Purchase.
LINK BELT K370 Shovel, 1¾ cy, new 1953, used 4000 hrs. $26,000.
LINK BELT L885 Shovel, ¾ cy, heavy duty, #7A1324, new 1952, w/Cat. D318 diesel, bargain, $6850. Rental Purchase. Yard.
LORAIN L41 Shovel, ¾ cy, w/Cat. D318 diesel, new 1949, #19634. $6500 Yard.
CLAMSHELL BUCKETS, Haiss ¾ cy, w/teeth & ctwg., new. $875. Haiss 2 cy, w/teeth & ctwg., new. $1500 Yard.
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CEDARAPIDS 3042 IMPACT PORTABLE PLANT w/12' apron feeder, underconveyor, Murphy diesel factory tandem rubber, all new 1952, reconditioned. $28,000 Rental Purchase.
CEDARAPIDS 40x24 rb. Double Roll Crushers good. $3500 Washington, D.C.
CEDARAPIDS 2-Unit Portable Plant, model 2A, w/18x24 rb. Jaw, feeder, conveyor, power, tandem rubber. Secondary 16x24 rb. Roll. 3x10 screen, rotovator, conveyors, power, tandem rubber. Like new. $17,500 El Paso, Texas.
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JAW DIES for CEDARAPIDS 32x10, and 25x10, new, manganese. Less than ½ price. $485 each. Also for Diamond 30x42, $485. Pioneer 30x42, $475.
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SIMPLICITY 4x12 2-deck mill. D Screen, factory retuilt, like new. ½ price. $2350 Yard.
SYMONS 3x10 2-deck flat screen, good. $950 Yard.
DEISTER 4x8 single deck w/motor & bin mounting, excellent. $850.
DEISTER 4x8 2-deck Screen, new. With motor. Save over 40%. $2350.
TELSMITH 5x12 3-deck Screen, w/motor, good. $2850.
TELSMITH 3x10 2-deck Screens, w/motors, good. $1250.
TELSMITH 42" x 12' apron feeder, good. $2000.
CEDARAPIDS 3x7 apron feeder, w/hopper, legs. $1750.
BARBER GREEN 522 Bucket Loader on rubber w/Swivel conveyor, excellent. 21850 Yard.

WENZEL MACHY. CO.
565 S. 10th MAyfair 1-1710 Kansas City, Kan.

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General Motors 51-71-110 Injector Parts
Barnes and Gear Type Fuel Pumps

Write or Ship—Harrison
2093 East 19 St. Cleveland 15, O.

FOR SALE

Shovel front complete w/dipper sticks and bucket—For Osgood Chief Type 90 machine—Amesco 1¾ Rock Bucket. All in excellent condition.

THE WESTERN SAND & GRAVEL COMPANY
SPRING VALLEY, ILLINOIS

GENERATOR SETS

2—Columbia Model 200 KW Generator Sets 440V—3 Phase—60 Cycle. Powered by Caterpillar Model 375 Diesel engines, complete with floor type panel board with standard instruments and air starting equipment.

Generator Serial Nos. 55C8499 & 8500
Engines Serial Nos. 18R156 & 158

Less than 2800 hours operation
(Replacement Cost $27,000.00 each)
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4—6 x 14 Simplicity VIBRATING FEEDERS.
HYDRATED LIME PLANT 50 tons per day.
25—Link Belt 10" SCREW CONVEYORS 10½'.
Barber Greene 840 & 848 ASPHALT PLANTS.
CRUSHING PLANTS: C. R. Jr. Tandem & Pitmaster; 38-V Pioneer; Iowa 1036, 1836 & 2036; Iowa 3030 Impactor. SYMONS 2', 3' & 4', 3036 Dixie & 4033 C. R. HAMMERMILLS. 54" Stedman. SHOVELS: 54-B electric, Lima 802, Koehring 605, N. W. 25. Many others.
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STANLEY B. TROYER EQUIP. CO.
Box 97 Phone 500 Crosby, Minnesota

Enter 247 on card, page 139 →

Waiting for the Run to Taconite Harbor. This is a portion of Erie Mining Company's vast operation at Hoyt Lakes, Minn. Here taconite is mined, crushed, powdered, and rolled into tiny balls. Each year millions of tons of these pellets are shipped by rail to Taconite Harbor on Lake Superior, 74 miles away. At the port they begin the second stage of their journey to various steel mills.

That huge machine you see at work is the pellet-stacker, which dumps the loads from the agglomerating plant into a storage area. Rigged throughout with Bethlehem wire rope and bridge strand, it employs cables ranging in size to 3¼ in. This mechanical giant is a tough taskmaster, but the Bethlehem ropes have been equal in every way to the rugged work which has been assigned to them.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem Wire Rope

BETHLEHEM STEEL

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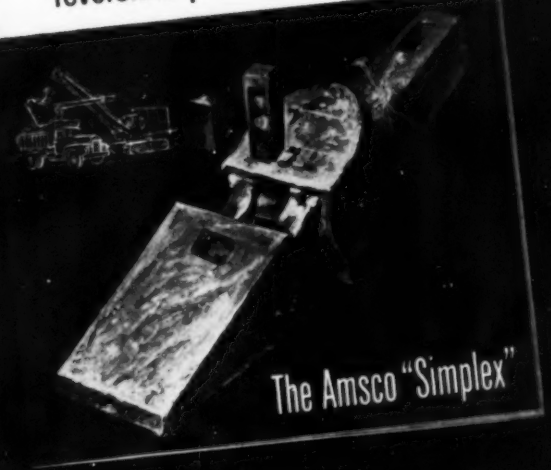
*See also Detailed Information in 1958 Pit and Quarry HANDBOOK and CONCRETE INDUSTRIES YEARBOOK.

Cut your dipper tooth costs up to 75%!

● BUYERS' GUIDE

AMSCO'S NEW 2 PART reversible point dipper tooth



The answer . . . Amsco's new Simplex 2-part dipper tooth. On job after job, this new tooth design, made of a new Amsco alloy, is outlasting all competitive teeth 2-1, even 4-1 before reversal.

There is a Simplex for every power shovel . . . bucket, dipper or hoe . . . original equipment or replacement.

To help you to reach new highs in dipper-tooth service life and new lows in maintenance, AMSCO® has prepared this Buyers' Guide.

You'll find complete design and dimensional details on the Simplex that is *precisely right* for the working end of your shovel.

More than 125 power shovel models with bucket capacities ranging from $\frac{3}{8}$ thru 9 yards are tabulated for quick, accurate selection.

Send coupon today for your free copy!

American Manganese Steel Division
Chicago Heights, Illinois

Please send me your Buyers' Guide for dipper teeth, side cutters and buckets.

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AMSCO

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ANNOUNCING TWO NEW LIMAS

TYPE 64	TYPE 64-SC
1¼ Yd. Shovel	SPECIAL CRANE
40 Ton Crane	50 Ton Capacity
13'3" Long Crawlers	17'1½" Long Crawlers
10'8" Wide Crawlers	14'0" Wide Crawlers
With 30" Treads	With 42" Treads

- **Easily converts in field for use as shovel, crane, dragline, clamshell or pullshovel**
- **Crawler, truck or wagon mounting available**
- **Choice of gas or diesel power—with torque converter**
- **Lima's precision air control lets operator work all day without tiring**

Newest Lima, Type 64—shown here with 22-ft. boom, 18-ft. handle, 1¼-yd. dipper.

The rugged new Lima Type 64 fills a definite need for a heavy duty 1¼-yd. shovel, 40-ton crane, dragline and 1¼-yd. pullshovel that will combine dependable high performance with low maintenance costs, for maximum profit! The new type 64-SC with extra long, wide crawlers is designed for special crane service. This new Lima has a capacity of 50 tons on a 40' boom at 10' radius.

Lima Quality Features

You get these, and many more, Lima quality features in the 64 and 64-SC; precision-machined teeth on heat-treated alloy steel gears; long-lasting, trouble-free anti-friction roller bearings; safe, sure band brake and jaw clutch power steering; splined shafting; extra-large-diameter hoist, crowd swing and propel clutches; independent planetary boom hoist.

Crawler truck base is strong one-piece alloy steel casting with integral machined ring gear and flame-hardened roller path. Rotating base is one-piece carbon steel casting, built to absorb severest shocks of hard digging. Center pin is relieved of strain by six hook-type conical rollers tapered to revolve naturally around double-flanged roller path.

Like all Limas, the 64 and 64-SC are good travelers. Strips down easily for haulage. Side frame assemblies, complete with treads, are simple to remove. Ledge mounted, one-piece rear counterweight can be easily removed. When equipped for crane service, folding or telescoping gantries can be lowered to cab height for low clearance.

Designed to Outperform

Service is easy, every part readily accessible. Simplicity of power transmission design lessens friction, reduces upkeep, and delivers more power. Torque converter prevents engine stall, cushions shocks to operator and machine, increases performance by building up line pull.

Learn more about the Type 64 and 64-SC, newest members of the Lima family of high-performance construction equipment —The Lima line includes shovels to 6 cu. yd., cranes to 110 tons, draglines variable. Write or see your Lima distributor now.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA Construction Equipment Division, Lima, Ohio

BALDWIN · LIMA · HAMILTON

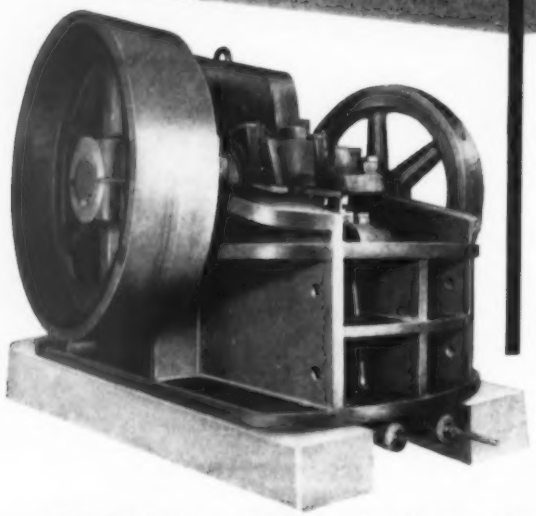
5938

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

Traylor-made Type HB Jaw Crushers offer efficiency and economy

Shown above is a Traylor-made 48" x 60" Type HB Jaw Crusher in a stone crushing plant.

A Traylor-made 36" x 42" Type HB Jaw Crusher in a cement plant.



Many operators throughout the world experience daily the economy and rugged dependability of Traylor-made HB Jaw Crushers. Jaw plates are the famous curved type—the pitman shaft is made of annealed open hearth forged steel, light but of great strength. The swing jaw is made of cast steel of extra-heavy box section design to secure maximum strength. These are a few features of the Traylor HB Jaw Crusher. For additional information, write for bulletin No. 5105 today!

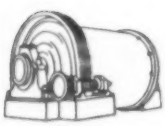
Traylor

TRAYLOR ENGINEERING & MFG. CO.

1135 MILL ST., ALLENTOWN, PA.

Sales Offices: New York — Chicago — San Francisco

Canadian Mfr.: Canadian Vickers, Ltd., Montreal, P.Q.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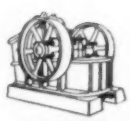
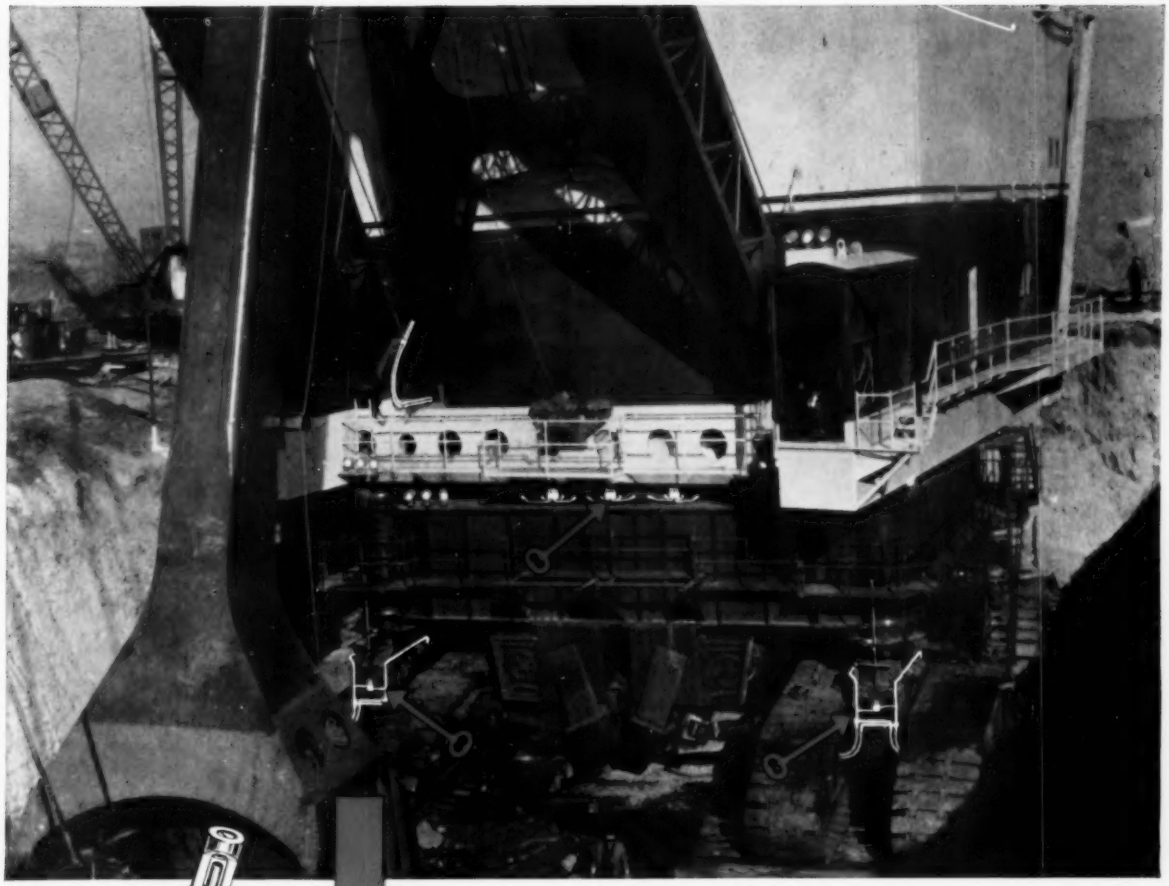
ROTARY KILNS

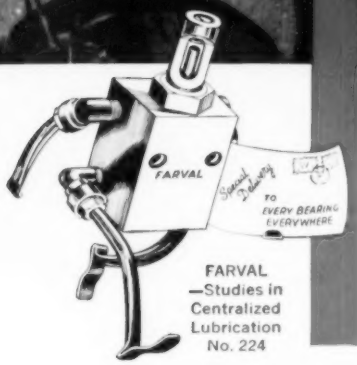
APRON FEEDERS

PRIMARY GYRATORY CRUSHERS


JAW CRUSHERS

SECONDARY GYRATORY CRUSHERS





FARVAL
—Studies in
Centralized
Lubrication
No. 224

Farval handles lubrication requirements for shovel bearings under 6,000,000 pound load

On this Marion #5760 shovel in the Midland Colleries near Victoria, Illinois, some 6,000,000 pounds rest on eight crawlers. The constant, positive lubrication required at the shovel's 336 undercarriage points is provided by a Farval air-operated system.

Another Farval system serves 115 roller circle bearings and 12 center pin thrust points through a system which can be disconnected as the points rotate.

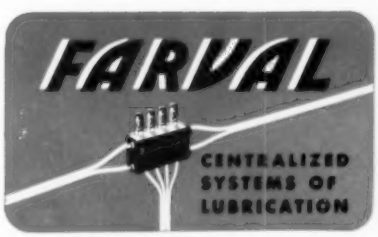
A critical group of 33 points which move in a 165° arc and 58 other points on the huge shovel are similarly protected by modern Farval lubrication systems.

Where load pressures are high, where flexibility is required, and where lubrication without downtime is desired, Farval systems are the answer. Write today for revised Bulletin 26-S, The Farval Corporation, 3280 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.

KEYS TO ADEQUATE LUBRICATION

Wherever you see the sign of Farval—familiar valve manifolds, dual lubricant lines and central pumping station—you know a machine is being properly lubricated.



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Appearance may be improved through better design, sharper color printing, reproportioning, or better choice of outside wall.

A frank discussion with us may result in a more attractive bag, reduced production costs and increased sales of your product.

When will you talk with our representative?

The Newest KRAFTPACKER

will handle any free-flowing material f-a-s-t-e-r, with more accuracy, than any bag filling machine of its type!

KRAFT BAG CORPORATION

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630 Fifth Avenue, New York 20, N. Y.
Daily News Bldg., Chicago 6, Ill.

Integrated mills at St. Marys, Georgia and Gilman, Vermont

Gilman PAPER CO.
• St. Marys Kraft Corp.
• Command Tape Div.
• The Gilbound Corp.
• Kraft Bag Corp.

☐ We are interested in improving our bag.
☐ We are interested in your Kraftpacker.

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